

Global Terrorism Data Cleaning

Importing the Libraries

```
In [ ]: import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
import numpy as np
```

- Load the datasets

```
In [ ]: original_data = pd.read_csv("Global-terrorism-Datasets.csv")
```

C:\Users\Akash Pandey\AppData\Local\Temp\ipykernel_18356\1104420386.py:1: Dtype Warning: Columns (4,6,31,33,61,62,63,76,79,90,92,94,96,114,115,121) have mixed types. Specify dtype option on import or set low_memory=False.
original_data = pd.read_csv("Global-terrorism-Datasets.csv")

```
In [ ]: df = original_data.copy() # Make a copy of original datasets
```

```
In [ ]: pd.set_option('display.max_columns', None) # for showing the all columns in data
```

```
In [ ]: df.head() # top 5 rows
```

```
Out[ ]:
```

| | eventid | iyear | imonth | iday | approxdate | extended | resolution | country | country_txt |
|---|--------------|-------|--------|------|------------|----------|------------|---------|--------------------|
| 0 | 197000000001 | 1970 | 7 | 2 | NaN | 0 | NaN | 58 | Dominican Republic |
| 1 | 197000000002 | 1970 | 0 | 0 | NaN | 0 | NaN | 130 | Mexico |
| 2 | 197001000001 | 1970 | 1 | 0 | NaN | 0 | NaN | 160 | Philippines |
| 3 | 197001000002 | 1970 | 1 | 0 | NaN | 0 | NaN | 78 | Greece |
| 4 | 197001000003 | 1970 | 1 | 0 | NaN | 0 | NaN | 101 | Japan |

```
In [ ]: df.shape
```

```
Out[ ]: (181691, 135)
```

```
In [ ]: df.columns = df.columns.str.title()
```

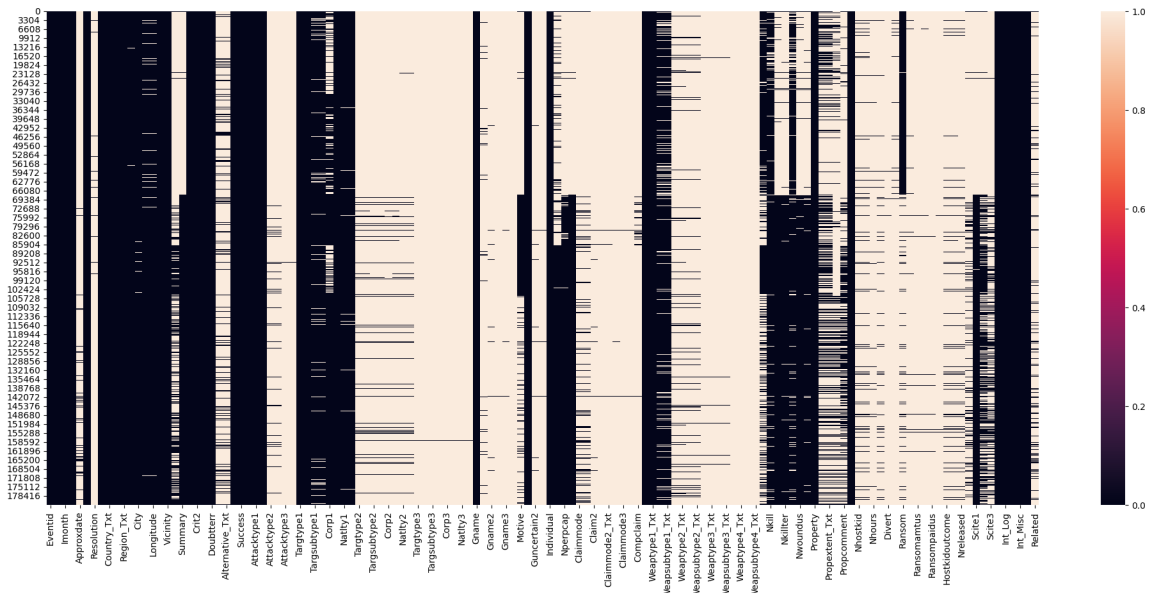
```
In [ ]: df.isnull().sum()
```

```
Out[ ]: Eventid      0
        Iyear       0
        Imonth      0
        Iday        0
        Approxdate  172452
        ...
        Int_Log     0
        Int_Ideo    0
        Int_Misc    0
        Int_Any     0
        Related     156653
        Length: 135, dtype: int64
```

```
In [ ]: plt.figure(figsize=(25,10))

sns.heatmap(df.isnull())
```

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



```
In [ ]: # Check the size of the dataset
num_records, num_attributes = df.shape
print(f"The dataset contains {num_records} records and {num_attributes} Columns.")

The dataset contains 181691 records and 135 Columns.
```

```
In [ ]: # Check the data types of the attributes
print("Data types of the attributes:")
print(df.dtypes)
```

Data types of the attributes:

```
Eventid      int64
Iyear        int64
Imonth       int64
Iday         int64
Approxdate   object
...
Int_Log      int64
Int_Ideo     int64
Int_Misc     int64
Int_Any      int64
Related      object
Length: 135, dtype: object
```

```
In [ ]: # Check for missing values
num_missing_values = df.isnull().sum().sum()
print(f"\nThe dataset contains {num_missing_values} missing values.\n")
```

The dataset contains 13853997 missing values.

```
In [ ]: # Check for duplicate records
num_duplicate_records = df.duplicated().sum()
print(f"The dataset contains {num_duplicate_records} duplicate records.")
```

The dataset contains 0 duplicate records.

```
In [ ]: # changing the null columns in persentange form
null_col = df.isnull().sum()/len(df)*100
null_col
```

```
Out[ ]: Eventid      0.000000
Iyear        0.000000
Imonth       0.000000
Iday         0.000000
Approxdate   94.914993
...
Int_Log      0.000000
Int_Ideo     0.000000
Int_Misc     0.000000
Int_Any      0.000000
Related      86.219461
Length: 135, dtype: float64
```

```
In [ ]: # filter the columns which columns has more the 0% values.
null_col = null_col.loc[null_col.values>0]
null_col
```

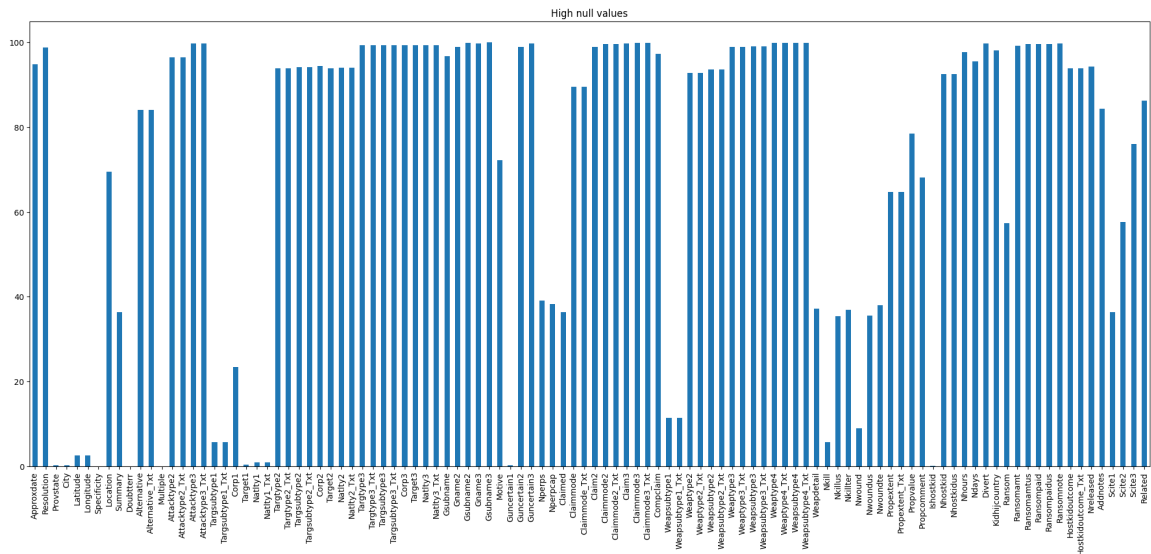
```
Out[ ]: Approxdate   94.914993
Resolution    98.778145
Provstate     0.231712
City          0.238867
Latitude      2.507554
...
Addnotes      84.430159
Scite1        36.430533
Scite2        57.657231
Scite3        76.049447
Related       86.219461
Length: 106, dtype: float64
```

```
In [ ]: # plotting the null columns which are having more than 0 % null values

plt.figure(figsize=(25,10))

null_col.plot(kind='bar', title='High null values')
```

```
Out[ ]: <Axes: title={'center': 'High null values'}>
```



```
In [ ]: # filter that columns who have more than 50% null values in the datasets

null_col_50 = null_col.loc[null_col.values > 50]
null_col_50
```

```
Out[ ]: Approxdate      94.914993
Resolution    98.778145
Location      69.456385
Alternative    84.032781
Alternative_Txt 84.032781
...
Nreleas       94.275996
Addnotes      84.430159
Scite2        57.657231
Scite3        76.049447
Related       86.219461
Length: 77, dtype: float64
```

```
In [ ]: # there are that columns which are having more than 50 % null values
null_col_50.index
```

```
Out[ ]: Index(['Approxdate', 'Resolution', 'Location', 'Alternative',
              'Alternative_Txt', 'Attacktype2', 'Attacktype2_Txt', 'Attacktype3',
              'Attacktype3_Txt', 'Targtype2', 'Targtype2_Txt', 'Targsubtype2',
              'Targsubtype2_Txt', 'Corp2', 'Target2', 'Natlty2', 'Natlty2_Txt',
              'Targtype3', 'Targtype3_Txt', 'Targsubtype3', 'Targsubtype3_Txt',
              'Corp3', 'Target3', 'Natlty3', 'Natlty3_Txt', 'Gsubname', 'Gname2',
              'Gsubname2', 'Gname3', 'Gsubname3', 'Motive', 'Guncertain2',
              'Guncertain3', 'Claimmode', 'Claimmode_Txt', 'Claim2', 'Claimmode2',
              'Claimmode2_Txt', 'Claim3', 'Claimmode3', 'Claimmode3_Txt', 'Compclaim',
              'Weaptype2', 'Weaptype2_Txt', 'Weapsubtype2', 'Weapsubtype2_Txt',
              'Weaptype3', 'Weaptype3_Txt', 'Weapsubtype3', 'Weapsubtype3_Txt',
              'Weaptype4', 'Weaptype4_Txt', 'Weapsubtype4', 'Weapsubtype4_Txt',
              'Propextent', 'Propextent_Txt', 'Propvalue', 'Propcomment', 'Nhostkid',
              'Nhostkidus', 'Nhours', 'Ndays', 'Divert', 'Kidhijcountry', 'Ransom',
              'Ransomamt', 'Ransomamtus', 'Ransompaid', 'Ransompaidus', 'Ransomnote',
              'Hostkidoutcome', 'Hostkidoutcome_Txt', 'Nreleased', 'Addnotes',
              'Scite2', 'Scite3', 'Related'],
              dtype='object')
```

```
In [ ]: print(f'The total number of columns is {len(null_col_50)} have more than 50% col

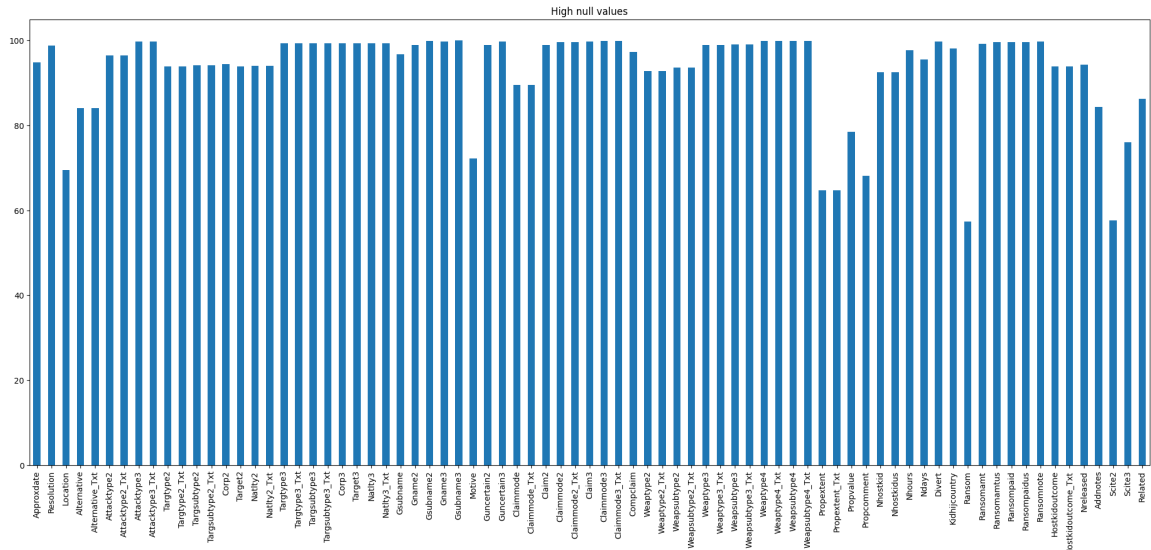
The total number of columns is 77 have more than 50% columns
```

```
In [ ]: # plotting the null columns which are having more than 50 % null values

plt.figure(figsize=(25,10))

null_col_50.plot(kind='bar', title='High null values')
```

```
Out[ ]: <Axes: title={'center': 'High null values'}>
```



```
In [ ]: # delete the columns who are having more than 50% null values in the datasets

df = df.drop(columns=list(null_col_50.index))
```

```
In [ ]: # chenkoing the columns number after deleting
num_records, num_attributes = df.shape
print(f'The dataset contains {num_records} records and {num_attributes} attribut

The dataset contains 181691 records and 58 attributes after the deleting the h
igh null vaules columns.
```

```
In [ ]: # again check the null values after deleting teh 50 % null values  
df.isnull().sum().sum()
```

Out[]: 817707

```
In [ ]: # changing the null values in %  
null_col1 = df.isnull().sum()/len(df)*100  
null_col1
```

```

Out[ ]: Eventid      0.000000
        Iyear        0.000000
        Imonth       0.000000
        Iday         0.000000
        Extended     0.000000
        Country      0.000000
        Country_Txt  0.000000
        Region       0.000000
        Region_Txt   0.000000
        Provstate    0.231712
        City         0.238867
        Latitude     2.507554
        Longitude    2.508104
        Specificity   0.003302
        Vicinity     0.000000
        Summary      36.396409
        Crit1        0.000000
        Crit2        0.000000
        Crit3        0.000000
        Doubtterr    0.000550
        Multiple     0.000550
        Success      0.000000
        Suicide      0.000000
        Attacktype1  0.000000
        Attacktype1_Txt 0.000000
        Targtype1    0.000000
        Targtype1_Txt 0.000000
        Targsubtype1 5.709144
        Targsubtype1_Txt 5.709144
        Corp1        23.418882
        Target1      0.350045
        Natlty1      0.858050
        Natlty1_Txt  0.858050
        Gname        0.000000
        Guncertain1  0.209146
        Individual   0.000000
        Nperps       39.140629
        Nperpcap     38.245703
        Claimed      36.391456
        Weaptype1    0.000000
        Weaptype1_Txt 0.000000
        Weapsubtype1 11.430396
        Weapsubtype1_Txt 11.430396
        Weapdetail   37.244553
        Nkill        5.676120
        Nkillus      35.470111
        Nkillter     36.852678
        Nwound       8.977330
        Nwoundus     35.611010
        Nwoundte     38.055270
        Property     0.000000
        Ishostkid     0.097969
        Scite1       36.430533
        Dbsource     0.000000
        Int_Log      0.000000
        Int_Ideo     0.000000
        Int_Misc     0.000000
        Int_Any      0.000000
dtype: float64

```

```
plt.figure(figsize=(25,10))  
null_col1.plot(kind='bar')
```

[illegible]

```
df.select_dtypes(include=object).columns
```

```
Index(['Country_Txt', 'Region_Txt', 'Provstate', 'City', 'Summary',
      'Attacktype1_Txt', 'Targtype1_Txt', 'Targsubtype1_Txt', 'Corp1',
      'Target1', 'Natlty1_Txt', 'Gname', 'Weaptype1_Txt', 'Weapsubtype1_Txt',
      'Weapdetail', 'Scite1', 'Dbsource'],
      dtype='object')
```

```
# Now, replace null values with "Unknown"
```

```
df[df.select_dtypes(include=object).columns] = df[df.select_dtypes(include=object).columns].fillna("Unknown")
```

```
# checking the null values for string datatypes columns
df.select_dtypes(include=object).isnull().sum()
```



```
Out[ ]: Country_Txt      0
        Region_Txt      0
        Provstate       0
        City            0
        Summary         0
        Attacktype1_Txt 0
        Targtype1_Txt   0
        Targsubtype1_Txt 0
        Corp1          0
        Target1         0
        Natlty1_Txt     0
        Gname          0
        Weaptype1_Txt   0
        Weapsubtype1_Txt 0
        Weapdetail      0
        Scite1         0
        Dbsource        0
        dtype: int64
```

```
In [ ]: # filter the intiger and float columns
        df.select_dtypes(exclude=object).columns
```

```
Out[ ]: Index(['Eventid', 'Iyear', 'Imonth', 'Iday', 'Extended', 'Country', 'Region',
              'Latitude', 'Longitude', 'Specificity', 'Vicinity', 'Crit1', 'Crit2',
              'Crit3', 'Doubtterr', 'Multiple', 'Success', 'Suicide', 'Attacktype1',
              'Targtype1', 'Targsubtype1', 'Natlty1', 'Guncertain1', 'Individual',
              'Nperps', 'Nperpcap', 'Claimed', 'Weaptype1', 'Weapsubtype1', 'Nkill',
              'Nkillus', 'Nkillter', 'Nwound', 'Nwoundus', 'Nwoundte', 'Property',
              'Ishostkid', 'Int_Log', 'Int_Ideo', 'Int_Misc', 'Int_Any'],
              dtype='object')
```

```
In [ ]: # check info for intiger and float datatype columns
        df.select_dtypes(exclude=object).info()
```

```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 181691 entries, 0 to 181690
Data columns (total 41 columns):
#   Column                Non-Null Count  Dtype
---  -
0   Eventid                181691 non-null  int64
1   Iyear                  181691 non-null  int64
2   Imonth                 181691 non-null  int64
3   Iday                   181691 non-null  int64
4   Extended               181691 non-null  int64
5   Country                181691 non-null  int64
6   Region                 181691 non-null  int64
7   Latitude               177135 non-null  float64
8   Longitude              177134 non-null  float64
9   Specificity            181685 non-null  float64
10  Vicinity               181691 non-null  int64
11  Crit1                  181691 non-null  int64
12  Crit2                  181691 non-null  int64
13  Crit3                  181691 non-null  int64
14  Doubtterr             181690 non-null  float64
15  Multiple               181690 non-null  float64
16  Success                181691 non-null  int64
17  Suicide                181691 non-null  int64
18  Attacktype1           181691 non-null  int64
19  Targtype1             181691 non-null  int64
20  Targsubtype1          171318 non-null  float64
21  Natlty1               180132 non-null  float64
22  Guncertain1           181311 non-null  float64
23  Individual             181691 non-null  int64
24  Nperps                 110576 non-null  float64
25  Nperpcap              112202 non-null  float64
26  Claimed                115571 non-null  float64
27  Weaptype1             181691 non-null  int64
28  Weapsubtype1          160923 non-null  float64
29  Nkill                  171378 non-null  float64
30  Nkillus                117245 non-null  float64
31  Nkillter              114733 non-null  float64
32  Nwound                165380 non-null  float64
33  Nwoundus              116989 non-null  float64
34  Nwoundte              112548 non-null  float64
35  Property               181691 non-null  int64
36  Ishostkid              181513 non-null  float64
37  Int_Log                181691 non-null  int64
38  Int_Ideo               181691 non-null  int64
39  Int_Misc               181691 non-null  int64
40  Int_Any                181691 non-null  int64
dtypes: float64(19), int64(22)
memory usage: 56.8 MB

```

```

In [ ]: # replace the null values with 0 for intiger and float datatype columns in the a
df[df.select_dtypes(exclude=object).columns] = df[df.select_dtypes(exclude=objec

```

```

In [ ]: # checking the final null values
df.isnull().sum()

```

```

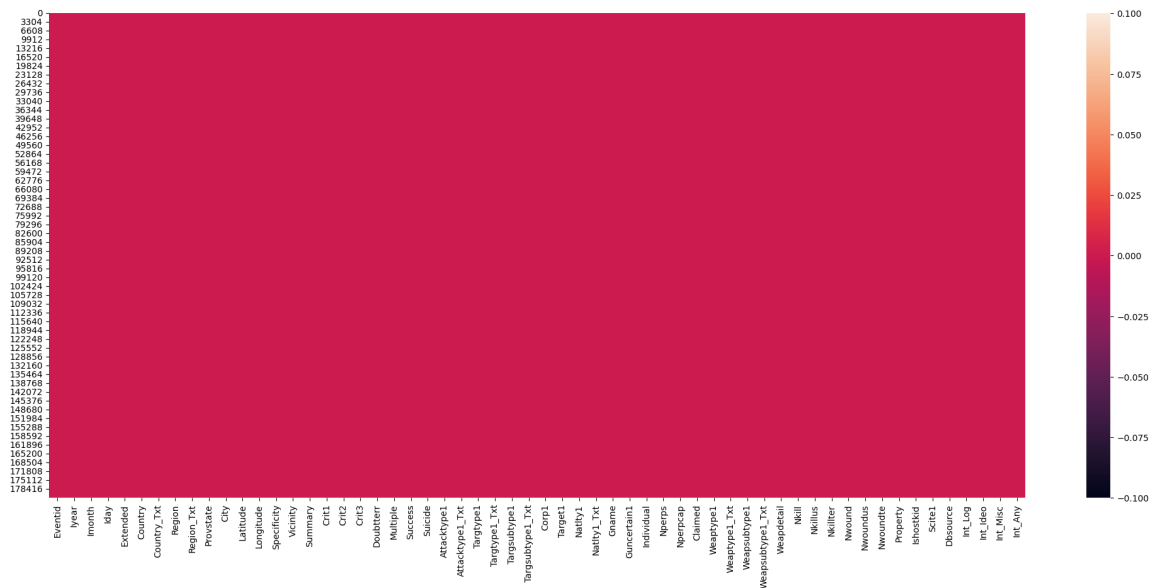
Out[ ]: Eventid      0
        Iyear        0
        Imonth       0
        Iday         0
        Extended     0
        Country      0
        Country_Txt  0
        Region       0
        Region_Txt   0
        Provstate    0
        City         0
        Latitude     0
        Longitude    0
        Specificity  0
        Vicinity     0
        Summary      0
        Crit1        0
        Crit2        0
        Crit3        0
        Doubtterr    0
        Multiple     0
        Success      0
        Suicide      0
        Attacktype1  0
        Attacktype1_Txt 0
        Targtype1    0
        Targtype1_Txt 0
        Targsubtype1 0
        Targsubtype1_Txt 0
        Corp1        0
        Target1      0
        Natlty1      0
        Natlty1_Txt  0
        Gname        0
        Guncertain1  0
        Individual   0
        Nperps       0
        Nperpcap     0
        Claimed      0
        Weaptype1    0
        Weaptype1_Txt 0
        Weapsubtype1 0
        Weapsubtype1_Txt 0
        Weapdetail   0
        Nkill        0
        Nkillus      0
        Nkillter     0
        Nwound       0
        Nwoundus     0
        Nwoundte     0
        Property     0
        Ishotkid     0
        Scite1       0
        Dbsource     0
        Int_Log      0
        Int_Ideo     0
        Int_Misc     0
        Int_Any      0
        dtype: int64

```

```
In [ ]: plt.figure(figsize=(25,10))

#ploting the final checking null values with heatmap
sns.heatmap(df.isnull())
```

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



- The graph is look Red it means that we dont have any null values in datasets

```
In [ ]: print(f'Now we have {df.isnull().sum().sum()} values in the Datasets')
```

Now we have 0 values in the Datasets

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

```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 181691 entries, 0 to 181690
Data columns (total 58 columns):
#   Column                Non-Null Count  Dtype
---  -
0   Eventid                181691 non-null int64
1   Iyear                  181691 non-null int64
2   Imonth                 181691 non-null int64
3   Iday                   181691 non-null int64
4   Extended               181691 non-null int64
5   Country                181691 non-null int64
6   Country_Txt            181691 non-null object
7   Region                 181691 non-null int64
8   Region_Txt             181691 non-null object
9   Provstate              181691 non-null object
10  City                   181691 non-null object
11  Latitude                181691 non-null float64
12  Longitude                181691 non-null float64
13  Specificity             181691 non-null float64
14  Vicinity                181691 non-null int64
15  Summary                 181691 non-null object
16  Crit1                   181691 non-null int64
17  Crit2                   181691 non-null int64
18  Crit3                   181691 non-null int64
19  Doubtterr              181691 non-null float64
20  Multiple                181691 non-null float64
21  Success                 181691 non-null int64
22  Suicide                 181691 non-null int64
23  Attacktype1             181691 non-null int64
24  Attacktype1_Txt         181691 non-null object
25  Targtype1               181691 non-null int64
26  Targtype1_Txt           181691 non-null object
27  Targsubtype1            181691 non-null float64
28  Targsubtype1_Txt        181691 non-null object
29  Corp1                   181691 non-null object
30  Target1                 181691 non-null object
31  Natlty1                 181691 non-null float64
32  Natlty1_Txt             181691 non-null object
33  Gname                   181691 non-null object
34  Guncertain1             181691 non-null float64
35  Individual               181691 non-null int64
36  Nperps                  181691 non-null float64
37  Nperpcap                181691 non-null float64
38  Claimed                 181691 non-null float64
39  Weaptype1               181691 non-null int64
40  Weaptype1_Txt           181691 non-null object
41  Weapsubtype1            181691 non-null float64
42  Weapsubtype1_Txt        181691 non-null object
43  Weapdetail              181691 non-null object
44  Nkill                   181691 non-null float64
45  Nkillus                 181691 non-null float64
46  Nkillter                181691 non-null float64
47  Nwound                  181691 non-null float64
48  Nwoundus                181691 non-null float64
49  Nwoundte                181691 non-null float64
50  Property                 181691 non-null int64
51  Ishostkid               181691 non-null float64
52  Scite1                  181691 non-null object
53  Dbsource                181691 non-null object
54  Int_Log                 181691 non-null int64

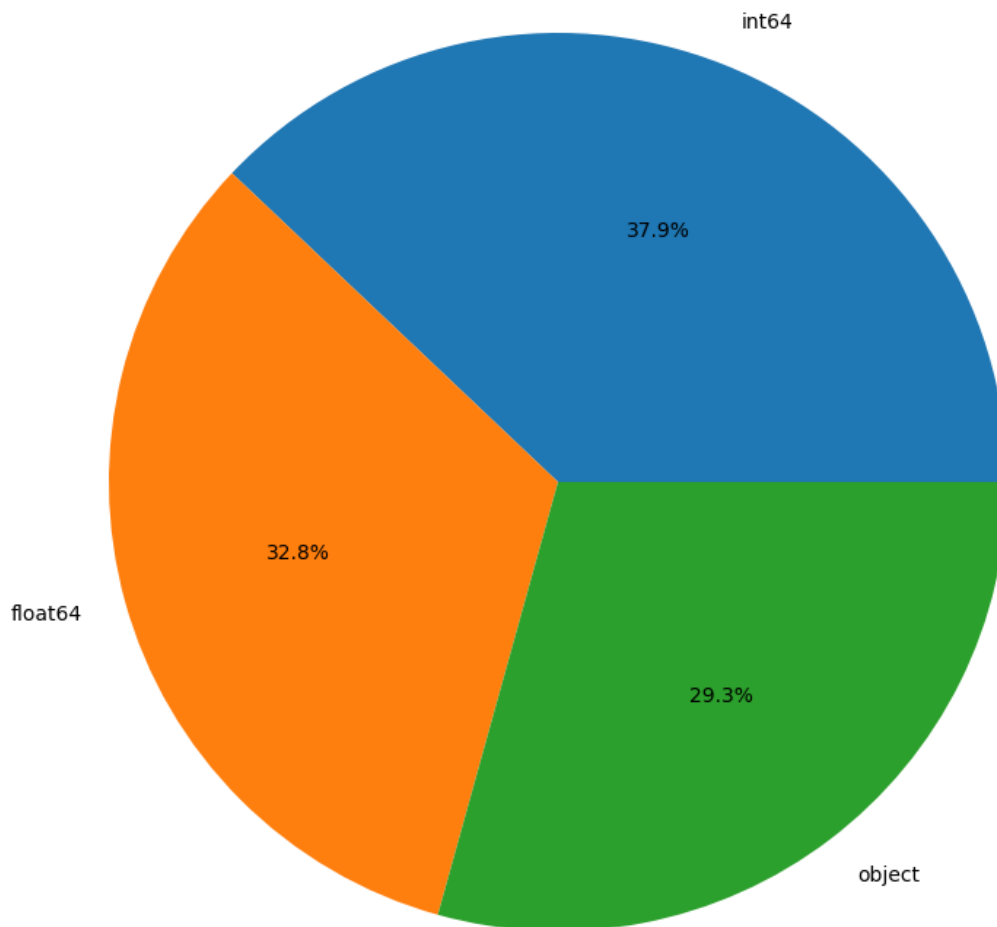
```

```
55 Int_Ideo      181691 non-null  int64
56 Int_Misc      181691 non-null  int64
57 Int_Any       181691 non-null  int64
dtypes: float64(19), int64(22), object(17)
memory usage: 80.4+ MB
```

```
In [ ]: plt.figure(figsize=(25,10))

df.dtypes.value_counts().plot(kind='pie', autopct='%1.1f%%')
```

Out[]: <Axes: >



```
In [ ]: df.isnull().sum().sum()
```

Out[]: 0

Now Data cleaning is Over So we export the cleaned dataset for perform EDA analysis on that

```
In [ ]: df.to_csv('Global-Terrorism-Cleaned-Datasets.csv', index=False)
```

In []: df

Out[]:

| | Eventid | Iyear | Imonth | Iday | Extended | Country | Country_Txt | Region | Region_ |
|--|---------|-------|--------|------|----------|---------|-------------|--------|---------|
|--|---------|-------|--------|------|----------|---------|-------------|--------|---------|

| | | | | | | | | | |
|---|---------------|------|---|---|---|----|--------------------|---|-----------------------------|
| 0 | 1970000000001 | 1970 | 7 | 2 | 0 | 58 | Dominican Republic | 2 | Central America & Caribbean |
|---|---------------|------|---|---|---|----|--------------------|---|-----------------------------|

| | | | | | | | | | |
|---|---------------|------|---|---|---|-----|--------|---|---------------|
| 1 | 1970000000002 | 1970 | 0 | 0 | 0 | 130 | Mexico | 1 | North America |
|---|---------------|------|---|---|---|-----|--------|---|---------------|

| | | | | | | | | | |
|---|---------------|------|---|---|---|-----|-------------|---|----------------|
| 2 | 1970010000001 | 1970 | 1 | 0 | 0 | 160 | Philippines | 5 | Southeast Asia |
|---|---------------|------|---|---|---|-----|-------------|---|----------------|

| | | | | | | | | | |
|---|---------------|------|---|---|---|----|--------|---|----------------|
| 3 | 1970010000002 | 1970 | 1 | 0 | 0 | 78 | Greece | 8 | Western Europe |
|---|---------------|------|---|---|---|----|--------|---|----------------|

| | | | | | | | | | |
|---|---------------|------|---|---|---|-----|-------|---|-----------|
| 4 | 1970010000003 | 1970 | 1 | 0 | 0 | 101 | Japan | 4 | East Asia |
|---|---------------|------|---|---|---|-----|-------|---|-----------|

| | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

| | | | | | | | | | |
|--------|--------------|------|----|----|---|-----|---------|----|----------------------------|
| 181686 | 201712310022 | 2017 | 12 | 31 | 0 | 182 | Somalia | 11 | Sahel & Sub-Saharan Africa |
|--------|--------------|------|----|----|---|-----|---------|----|----------------------------|

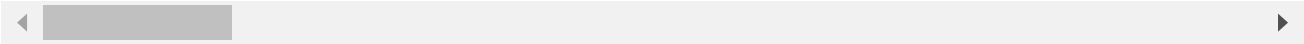
| | | | | | | | | | |
|--------|--------------|------|----|----|---|-----|-------|----|----------------------------|
| 181687 | 201712310029 | 2017 | 12 | 31 | 0 | 200 | Syria | 10 | Middle East & North Africa |
|--------|--------------|------|----|----|---|-----|-------|----|----------------------------|

| | | | | | | | | | |
|--------|--------------|------|----|----|---|-----|-------------|---|----------------|
| 181688 | 201712310030 | 2017 | 12 | 31 | 0 | 160 | Philippines | 5 | Southeast Asia |
|--------|--------------|------|----|----|---|-----|-------------|---|----------------|

| | | | | | | | | | |
|--------|--------------|------|----|----|---|----|-------|---|------------|
| 181689 | 201712310031 | 2017 | 12 | 31 | 0 | 92 | India | 6 | South Asia |
|--------|--------------|------|----|----|---|----|-------|---|------------|

| | | | | | | | | | |
|--------|--------------|------|----|----|---|-----|-------------|---|----------------|
| 181690 | 201712310032 | 2017 | 12 | 31 | 0 | 160 | Philippines | 5 | Southeast Asia |
|--------|--------------|------|----|----|---|-----|-------------|---|----------------|

181691 rows × 58 columns



Global Terrorist EDA Analysis

```
In [ ]: # import all libraries
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt

In [ ]: # Load the Datasets
cleaned_datasets = pd.read_csv("Global-Terrorism-Cleaned-Datasets.csv")

In [ ]: # for showing all columns

pd.set_option('display.max_columns', None)

In [ ]: # Copy from the original Datasets
df = cleaned_datasets.copy()

In [ ]: df.sample(5)
```

Out[]:

| | Eventid | lyear | lmonth | lday | Extended | Country | Country_Txt | Region | Region_ | |
|--|---------|--------------|--------|------|----------|---------|-------------|-------------|---------|-------------------------------|
| | 11825 | 198009120007 | 1980 | 9 | 12 | 0 | 61 | El Salvador | 2 | Central America Caribbean |
| | 87607 | 200806270009 | 2008 | 6 | 27 | 0 | 45 | Colombia | 3 | South America |
| | 157509 | 201601100018 | 2016 | 1 | 10 | 0 | 95 | Iraq | 10 | Middle East & North Africa |
| | 178989 | 201709190028 | 2017 | 9 | 19 | 0 | 200 | Syria | 10 | Middle East & North Africa |
| | 129061 | 201403200043 | 2014 | 3 | 20 | 0 | 95 | Iraq | 10 | Middle East & North Africa |


```
In [ ]: # check the null values

print(f" Here is the {df.isnull().sum().sum() } values in the datasets ")

Here is the 0 values in the datasets
```

```
In [ ]: # check the info

df.info()
```

```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 181691 entries, 0 to 181690
Data columns (total 58 columns):
#   Column                Non-Null Count  Dtype
---  -
0   Eventid                181691 non-null int64
1   Iyear                  181691 non-null int64
2   Imonth                 181691 non-null int64
3   Iday                   181691 non-null int64
4   Extended               181691 non-null int64
5   Country                181691 non-null int64
6   Country_Txt           181691 non-null object
7   Region                 181691 non-null int64
8   Region_Txt            181691 non-null object
9   Provstate             181691 non-null object
10  City                   181691 non-null object
11  Latitude               181691 non-null float64
12  Longitude              181691 non-null float64
13  Specificity            181691 non-null float64
14  Vicinity               181691 non-null int64
15  Summary                181691 non-null object
16  Crit1                  181691 non-null int64
17  Crit2                  181691 non-null int64
18  Crit3                  181691 non-null int64
19  Doubtterr             181691 non-null float64
20  Multiple               181691 non-null float64
21  Success                181691 non-null int64
22  Suicide                181691 non-null int64
23  Attacktype1            181691 non-null int64
24  Attacktype1_Txt       181691 non-null object
25  Targtype1              181691 non-null int64
26  Targtype1_Txt         181691 non-null object
27  Targsubtype1           181691 non-null float64
28  Targsubtype1_Txt      181691 non-null object
29  Corp1                  181691 non-null object
30  Target1                181691 non-null object
31  Natlty1               181691 non-null float64
32  Natlty1_Txt           181691 non-null object
33  Gname                  181691 non-null object
34  Guncertain1           181691 non-null float64
35  Individual             181691 non-null int64
36  Nperps                 181691 non-null float64
37  Nperpcap               181691 non-null float64
38  Claimed                181691 non-null float64
39  Weaptype1              181691 non-null int64
40  Weaptype1_Txt         181691 non-null object
41  Weapsubtype1           181691 non-null float64
42  Weapsubtype1_Txt      181691 non-null object
43  Weapdetail             181691 non-null object
44  Nkill                  181691 non-null float64
45  Nkillus                181691 non-null float64
46  Nkillter               181691 non-null float64
47  Nwound                 181691 non-null float64
48  Nwoundus               181691 non-null float64
49  Nwoundte               181691 non-null float64
50  Property               181691 non-null int64
51  Ishostkid              181691 non-null float64
52  Scite1                 181691 non-null object
53  Dbsource               181691 non-null object
54  Int_Log                181691 non-null int64

```

```
55  Int_Ideo          181691 non-null  int64
56  Int_Misc          181691 non-null  int64
57  Int_Any           181691 non-null  int64
dtypes: float64(19), int64(22), object(17)
memory usage: 80.4+ MB
```

Now, We Can start the EDA Analysis

Discriptive Analysis

```
In [ ]: df.describe().T
```

Out[]:

| | count | mean | std | min | 25% | |
|---------------------|----------|---------------|--------------|---------------|---------------|----------|
| Eventid | 181691.0 | 2.002705e+11 | 1.325957e+09 | 1.970000e+11 | 1.991021e+11 | 2.009022 |
| Iyear | 181691.0 | 2.002639e+03 | 1.325943e+01 | 1.970000e+03 | 1.991000e+03 | 2.009000 |
| Imonth | 181691.0 | 6.467277e+00 | 3.388303e+00 | 0.000000e+00 | 4.000000e+00 | 6.000000 |
| Iday | 181691.0 | 1.550564e+01 | 8.814045e+00 | 0.000000e+00 | 8.000000e+00 | 1.500000 |
| Extended | 181691.0 | 4.534622e-02 | 2.080629e-01 | 0.000000e+00 | 0.000000e+00 | 0.000000 |
| Country | 181691.0 | 1.319685e+02 | 1.124145e+02 | 4.000000e+00 | 7.800000e+01 | 9.800000 |
| Region | 181691.0 | 7.160938e+00 | 2.933408e+00 | 1.000000e+00 | 5.000000e+00 | 6.000000 |
| Latitude | 181691.0 | 2.290911e+01 | 1.869944e+01 | -5.315461e+01 | 9.518645e+00 | 3.112665 |
| Longitude | 181691.0 | -4.471911e+02 | 2.021946e+05 | -8.618590e+07 | 1.231572e+00 | 4.314357 |
| Specificity | 181691.0 | 1.451404e+00 | 9.954480e-01 | 0.000000e+00 | 1.000000e+00 | 1.000000 |
| Vicinity | 181691.0 | 6.829727e-02 | 2.845529e-01 | -9.000000e+00 | 0.000000e+00 | 0.000000 |
| Crit1 | 181691.0 | 9.885300e-01 | 1.064825e-01 | 0.000000e+00 | 1.000000e+00 | 1.000000 |
| Crit2 | 181691.0 | 9.930927e-01 | 8.282305e-02 | 0.000000e+00 | 1.000000e+00 | 1.000000 |
| Crit3 | 181691.0 | 8.756680e-01 | 3.299608e-01 | 0.000000e+00 | 1.000000e+00 | 1.000000 |
| Doubtterr | 181691.0 | -5.231685e-01 | 2.455813e+00 | -9.000000e+00 | 0.000000e+00 | 0.000000 |
| Multiple | 181691.0 | 1.377724e-01 | 3.446619e-01 | 0.000000e+00 | 0.000000e+00 | 0.000000 |
| Success | 181691.0 | 8.895983e-01 | 3.133907e-01 | 0.000000e+00 | 1.000000e+00 | 1.000000 |
| Suicide | 181691.0 | 3.650704e-02 | 1.875486e-01 | 0.000000e+00 | 0.000000e+00 | 0.000000 |
| Attacktype1 | 181691.0 | 3.247547e+00 | 1.915772e+00 | 1.000000e+00 | 2.000000e+00 | 3.000000 |
| Targtype1 | 181691.0 | 8.439719e+00 | 6.653838e+00 | 1.000000e+00 | 3.000000e+00 | 4.000000 |
| Targsubtype1 | 181691.0 | 4.428981e+01 | 3.197157e+01 | 0.000000e+00 | 2.100000e+01 | 3.400000 |
| Natlty1 | 181691.0 | 1.265908e+02 | 8.969172e+01 | 0.000000e+00 | 8.300000e+01 | 9.800000 |
| Guncertain1 | 181691.0 | 8.126985e-02 | 2.732498e-01 | 0.000000e+00 | 0.000000e+00 | 0.000000 |
| Individual | 181691.0 | 2.950064e-03 | 5.423446e-02 | 0.000000e+00 | 0.000000e+00 | 0.000000 |
| Nperps | 181691.0 | -3.977839e+01 | 1.719109e+02 | -9.900000e+01 | -9.900000e+01 | 0.000000 |
| Nperpcap | 181691.0 | -9.372616e-01 | 1.010951e+01 | -9.900000e+01 | 0.000000e+00 | 0.000000 |
| Claimed | 181691.0 | 3.159210e-02 | 8.722035e-01 | -9.000000e+00 | 0.000000e+00 | 0.000000 |
| Weaptype1 | 181691.0 | 6.447325e+00 | 2.173435e+00 | 1.000000e+00 | 5.000000e+00 | 6.000000 |
| Weapsubtype1 | 181691.0 | 9.846426e+00 | 7.062747e+00 | 0.000000e+00 | 4.000000e+00 | 1.100000 |
| Nkill | 181691.0 | 2.266860e+00 | 1.122706e+01 | 0.000000e+00 | 0.000000e+00 | 0.000000 |
| Nkillus | 181691.0 | 2.967126e-02 | 4.564308e+00 | 0.000000e+00 | 0.000000e+00 | 0.000000 |
| Nkillter | 181691.0 | 3.208249e-01 | 3.346474e+00 | 0.000000e+00 | 0.000000e+00 | 0.000000 |
| Nwound | 181691.0 | 2.883296e+00 | 3.430975e+01 | 0.000000e+00 | 0.000000e+00 | 0.000000 |
| Nwoundus | 181691.0 | 2.507554e-02 | 2.453378e+00 | 0.000000e+00 | 0.000000e+00 | 0.000000 |
| Nwoundte | 181691.0 | 6.638193e-02 | 1.172976e+00 | 0.000000e+00 | 0.000000e+00 | 0.000000 |

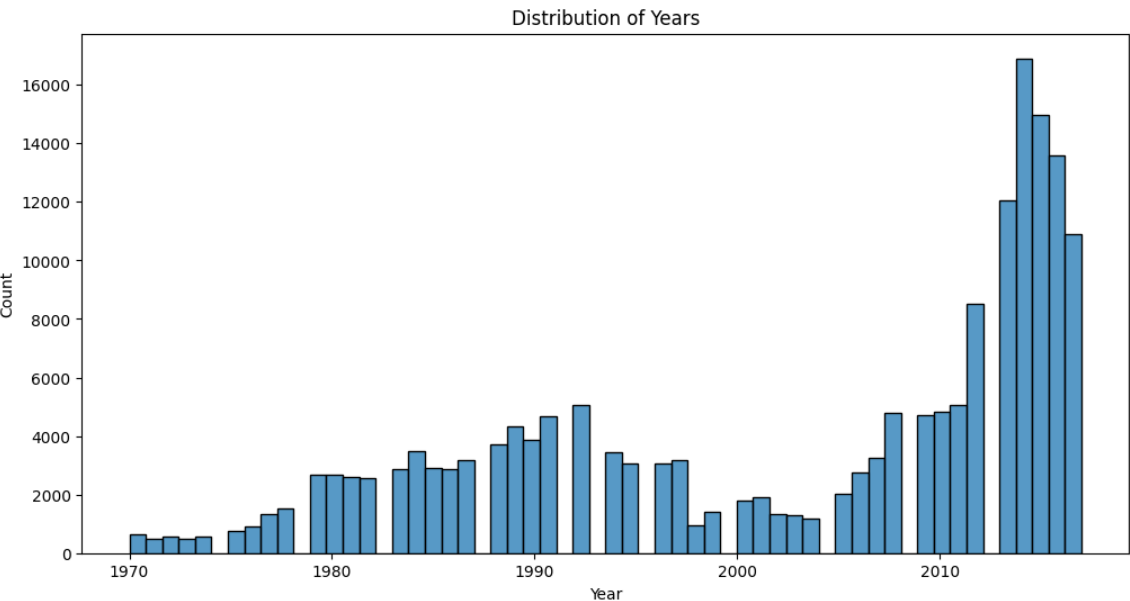
| | count | mean | std | min | 25% | |
|-----------|----------|---------------|--------------|---------------|---------------|---------------|
| Property | 181691.0 | -5.445564e-01 | 3.122889e+00 | -9.000000e+00 | 0.000000e+00 | 1.000000e+00 |
| Ishostkid | 181691.0 | 5.899577e-02 | 4.610220e-01 | -9.000000e+00 | 0.000000e+00 | 0.000000e+00 |
| Int_Log | 181691.0 | -4.543731e+00 | 4.543547e+00 | -9.000000e+00 | -9.000000e+00 | -9.000000e+00 |
| Int_Ideo | 181691.0 | -4.464398e+00 | 4.637152e+00 | -9.000000e+00 | -9.000000e+00 | -9.000000e+00 |
| Int_Misc | 181691.0 | 9.000996e-02 | 5.684573e-01 | -9.000000e+00 | 0.000000e+00 | 0.000000e+00 |
| Int_Any | 181691.0 | 3.045052e+00 | 4.601235e+00 | 0.000000e+00 | 0.000000e+00 | 0.000000e+00 |

Distributions

In []: df.columns

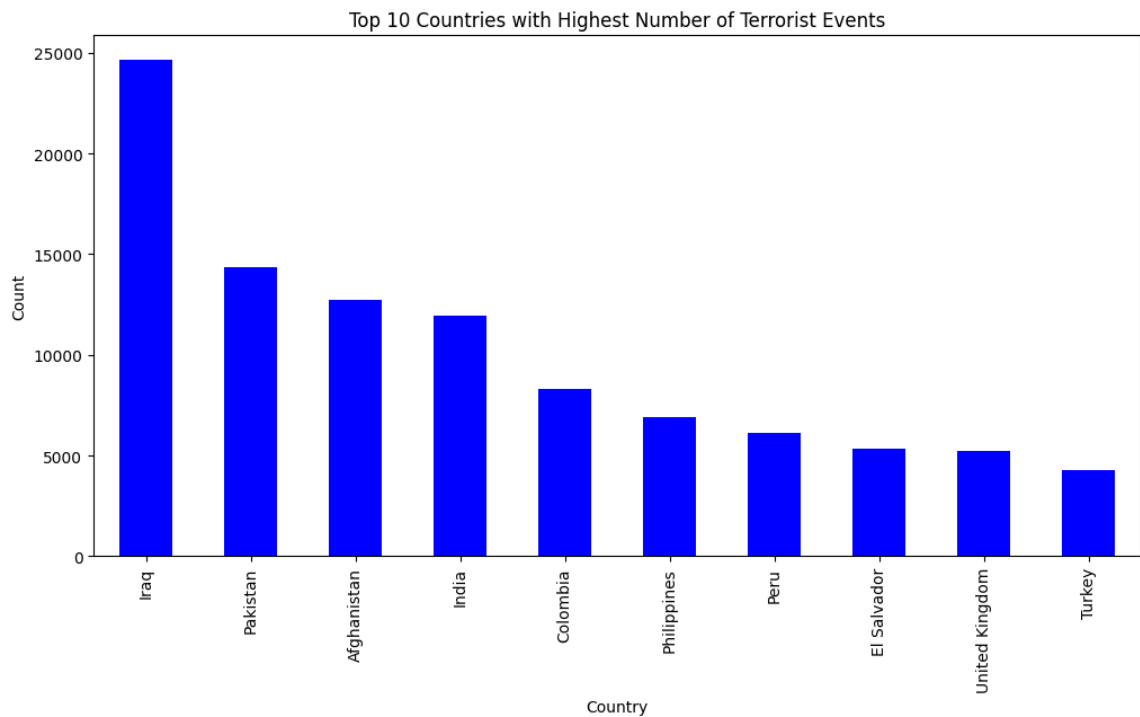
Out []: Index(['Eventid', 'Iyear', 'Imonth', 'Iday', 'Extended', 'Country',
'Country_Txt', 'Region', 'Region_Txt', 'Provstate', 'City', 'Latitude',
'Longitude', 'Specificity', 'Vicinity', 'Summary', 'Crit1', 'Crit2',
'Crit3', 'Doubtterr', 'Multiple', 'Success', 'Suicide', 'Attacktype1',
'Attacktype1_Txt', 'Targtype1', 'Targtype1_Txt', 'Targsubtype1',
'Targsubtype1_Txt', 'Corp1', 'Target1', 'Natlty1', 'Natlty1_Txt',
'Gname', 'Guncertain1', 'Individual', 'Nperps', 'Nperpcap', 'Claimed',
'Weaptype1', 'Weaptype1_Txt', 'Weapsubtype1', 'Weapsubtype1_Txt',
'Weapdetail', 'Nkill', 'Nkillus', 'Nkillter', 'Nwound', 'Nwoundus',
'Nwoundte', 'Property', 'Ishostkid', 'Scite1', 'Dbsource', 'Int_Log',
'Int_Ideo', 'Int_Misc', 'Int_Any'],
dtype='object')

In []: *# Ploting the distribution of the 'iyear' attribute*
plt.figure(figsize=(12,6))
sns.histplot(x=df['Iyear'])
plt.title('Distribution of Years')
plt.xlabel('Year')
plt.ylabel('Count')
plt.show()



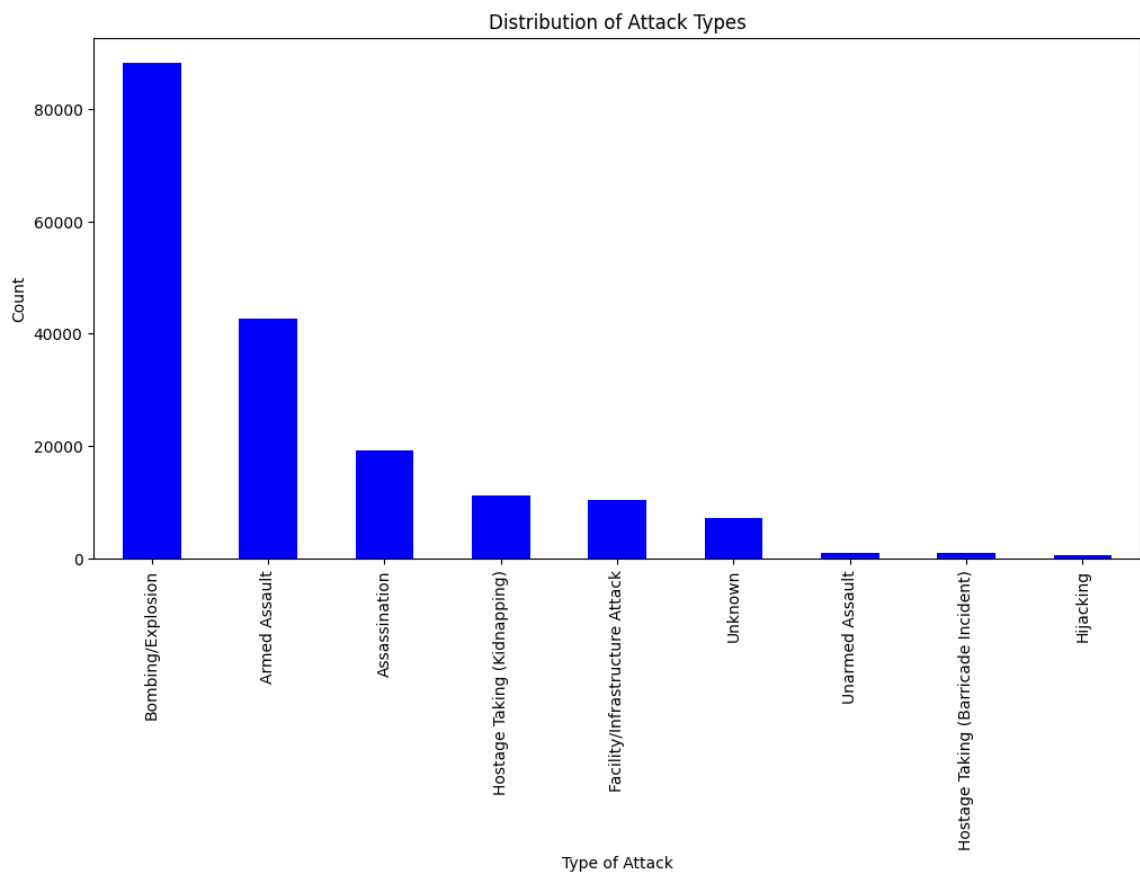
- The histogram depicts the distribution of terrorist events by year. We can observe that the frequency of terrorist events has increased significantly since the early 2000s, peaking around 2014.

```
In [ ]: # Plot the top 10 countries with the highest number of terrorist events
plt.figure(figsize=(12,6))
df['Country_Txt'].value_counts().head(10).plot(kind='bar', color='blue')
plt.title('Top 10 Countries with Highest Number of Terrorist Events')
plt.xlabel('Country')
plt.ylabel('Count')
plt.xticks(rotation=90)
plt.show()
```



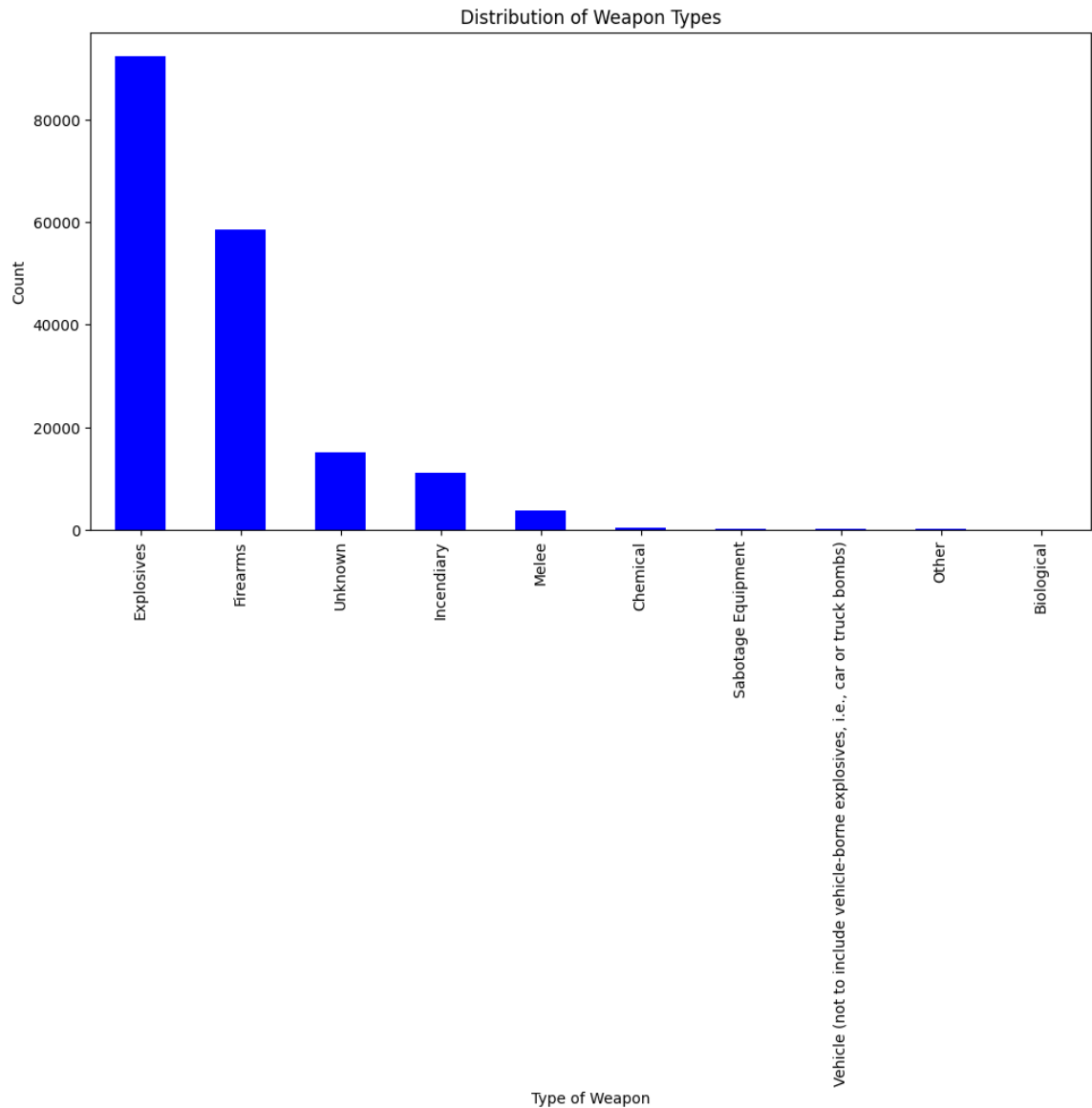
- The bar chart displays the top 10 countries with the highest number of recorded terrorist events. According to the data, Iraq, Pakistan, Afghanistan, and India are among the countries most affected by terrorism.

```
In [ ]: # Plot the distribution of attack types
plt.figure(figsize=(12,6))
df['Attacktype1_Txt'].value_counts().plot(kind='bar', color='blue')
plt.title('Distribution of Attack Types')
plt.xlabel('Type of Attack')
plt.ylabel('Count')
plt.xticks(rotation=90)
plt.show()
```



- The bar chart displays the distribution of types of attacks. The most common types of attacks, according to the data, are bombings/explosions, armed assaults, and assassinations.

```
In [ ]: # Plot the distribution of weapon types
plt.figure(figsize=(12,6))
df['Weaptype1_Txt'].value_counts().head(10).plot(kind='bar', color='blue')
plt.title('Distribution of Weapon Types')
plt.xlabel('Type of Weapon')
plt.ylabel('Count')
plt.xticks(rotation=90)
plt.show()
```



- The bar chart shows the distribution of the types of weapons used in these events. Explosives and firearms are the most commonly used weapons, according to the data.

Understanding the Distribution Graph

- The relationship between the year (iyear) and the country (country_txt), specifically for the top 5 countries with the highest number of terrorist events.
- The relationship between the type of attack (attacktype1_txt) and the type of weapon used (weaptype1_txt).

Temporal Analysis:

- How has the number of attacks evolved over time globally, and in the top 5 most affected countries?


```
In [ ]: # Calculate the yearly number of terrorist attacks globally
global_attacks = df.groupby('Iyear')['Eventid'].count()
global_attacks
```

```
Out[ ]: Iyear
1970      651
1971      471
1972      568
1973      473
1974      581
1975      740
1976      923
1977     1319
1978     1526
1979     2662
1980     2662
1981     2586
1982     2544
1983     2870
1984     3495
1985     2915
1986     2860
1987     3183
1988     3721
1989     4324
1990     3887
1991     4683
1992     5071
1994     3456
1995     3081
1996     3058
1997     3197
1998      934
1999     1395
2000     1814
2001     1906
2002     1333
2003     1278
2004     1166
2005     2017
2006     2758
2007     3242
2008     4805
2009     4721
2010     4826
2011     5076
2012     8522
2013    12036
2014    16903
2015    14965
2016    13587
2017    10900
Name: Eventid, dtype: int64
```

```
In [ ]: # Get the top 5 countries with the highest number of terrorist events
top_countries = df['Country_Txt'].value_counts().head(5).index
top_countries
```

```
Out[ ]: Index(['Iraq', 'Pakistan', 'Afghanistan', 'India', 'Colombia'], dtype='object')
```

```
In [ ]: # Filter the data for these top 5 countries  
df_top_countries = df[df['Country_Txt'].isin(top_countries)]  
df_top_countries
```

Out[]:

| | Eventid | Iyear | Imonth | Iday | Extended | Country | Country_Txt | Region | Region_ |
|--|---------|-------|--------|------|----------|---------|-------------|--------|---------|
|--|---------|-------|--------|------|----------|---------|-------------|--------|---------|

| | | | | | | | | | |
|-----|--------------|------|---|----|---|----|----------|---|-----------|
| 405 | 197007100001 | 1970 | 7 | 10 | 0 | 45 | Colombia | 3 | So Ame |
|-----|--------------|------|---|----|---|----|----------|---|-----------|

| | | | | | | | | | |
|-----|--------------|------|----|---|---|-----|----------|---|---------|
| 585 | 197011010001 | 1970 | 11 | 1 | 0 | 153 | Pakistan | 6 | South / |
|-----|--------------|------|----|---|---|-----|----------|---|---------|

| | | | | | | | | | |
|------|--------------|------|---|----|---|----|-------|---|---------|
| 1186 | 197202220004 | 1972 | 2 | 22 | 0 | 92 | India | 6 | South / |
|------|--------------|------|---|----|---|----|-------|---|---------|

| | | | | | | | | | |
|------|--------------|------|---|----|---|----|----------|---|-----------|
| 1392 | 197207170001 | 1972 | 7 | 17 | 0 | 45 | Colombia | 3 | So Ame |
|------|--------------|------|---|----|---|----|----------|---|-----------|

| | | | | | | | | | |
|------|--------------|------|----|---|---|----|----------|---|-----------|
| 1640 | 197212000001 | 1972 | 12 | 0 | 1 | 45 | Colombia | 3 | So Ame |
|------|--------------|------|----|---|---|----|----------|---|-----------|

| | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

| | | | | | | | | | |
|--------|--------------|------|----|----|---|----|------|----|-----------------------|
| 181679 | 201712310012 | 2017 | 12 | 31 | 0 | 95 | Iraq | 10 | Middle E & N Af |
|--------|--------------|------|----|----|---|----|------|----|-----------------------|

| | | | | | | | | | |
|--------|--------------|------|----|----|---|---|-------------|---|---------|
| 181683 | 201712310018 | 2017 | 12 | 31 | 0 | 4 | Afghanistan | 6 | South / |
|--------|--------------|------|----|----|---|---|-------------|---|---------|

| | | | | | | | | | |
|--------|--------------|------|----|----|---|----|-------|---|---------|
| 181684 | 201712310019 | 2017 | 12 | 31 | 0 | 92 | India | 6 | South / |
|--------|--------------|------|----|----|---|----|-------|---|---------|

| | | | | | | | | | |
|--------|--------------|------|----|----|---|---|-------------|---|---------|
| 181685 | 201712310020 | 2017 | 12 | 31 | 0 | 4 | Afghanistan | 6 | South / |
|--------|--------------|------|----|----|---|---|-------------|---|---------|

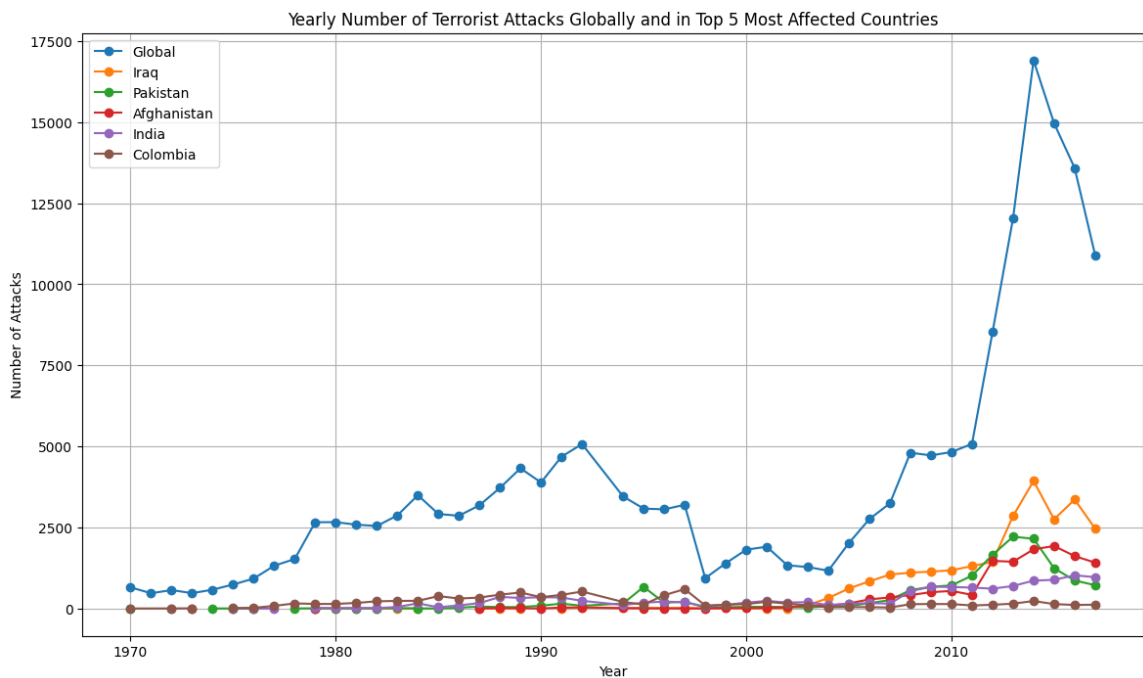
| | | | | | | | | | |
|--------|--------------|------|----|----|---|----|-------|---|---------|
| 181689 | 201712310031 | 2017 | 12 | 31 | 0 | 92 | India | 6 | South / |
|--------|--------------|------|----|----|---|----|-------|---|---------|

| Eventid | Iyear | Imonth | Iday | Extended | Country | Country_Txt | Region | Region_ |
|---------|-------|--------|------|----------|---------|-------------|--------|---------|
|---------|-------|--------|------|----------|---------|-------------|--------|---------|

| | | | | | | | | |
|-------|------|---|---|--|--|--|--|--|
| 73334 | 2003 | 5 | 1 | | | | | |
|-------|------|---|---|--|--|--|--|--|

```
In [ ]: # Calculate the yearly number of terrorist attacks in the top 5 most affected countries
attacks_in_top_countries = df_top_countries.groupby(['Iyear', 'Country_Txt'])['E
```

```
In [ ]: # Plot the yearly number of terrorist attacks
plt.figure(figsize=(14,8))
plt.plot(global_attacks.index, global_attacks.values, label='Global', marker='o')
for country in top_countries:
    plt.plot(attacks_in_top_countries.index, attacks_in_top_countries[country],
plt.title('Yearly Number of Terrorist Attacks Globally and in Top 5 Most Affected Countries')
plt.xlabel('Year')
plt.ylabel('Number of Attacks')
plt.legend()
plt.grid()
plt.show()
```



What can we find with line chart

- Globally, the number of terrorist attacks has generally increased over time, with some fluctuations. There were particularly sharp increases in the late 1980s and early 1990s, and again in the 2010s.
- Iraq has seen a significant increase in terrorist attacks since 2003, likely related to the Iraq War and the rise of ISIS.
- Pakistan, Afghanistan, and India have also seen increases in terrorist attacks, although not as dramatic as in Iraq.
- The United States saw a spike in terrorist attacks around 2001, likely due to the 9/11 attacks, but has had relatively few attacks since then.

Casualties analysis

```
In [ ]: # Display the names of all columns in the dataset
df.columns
```

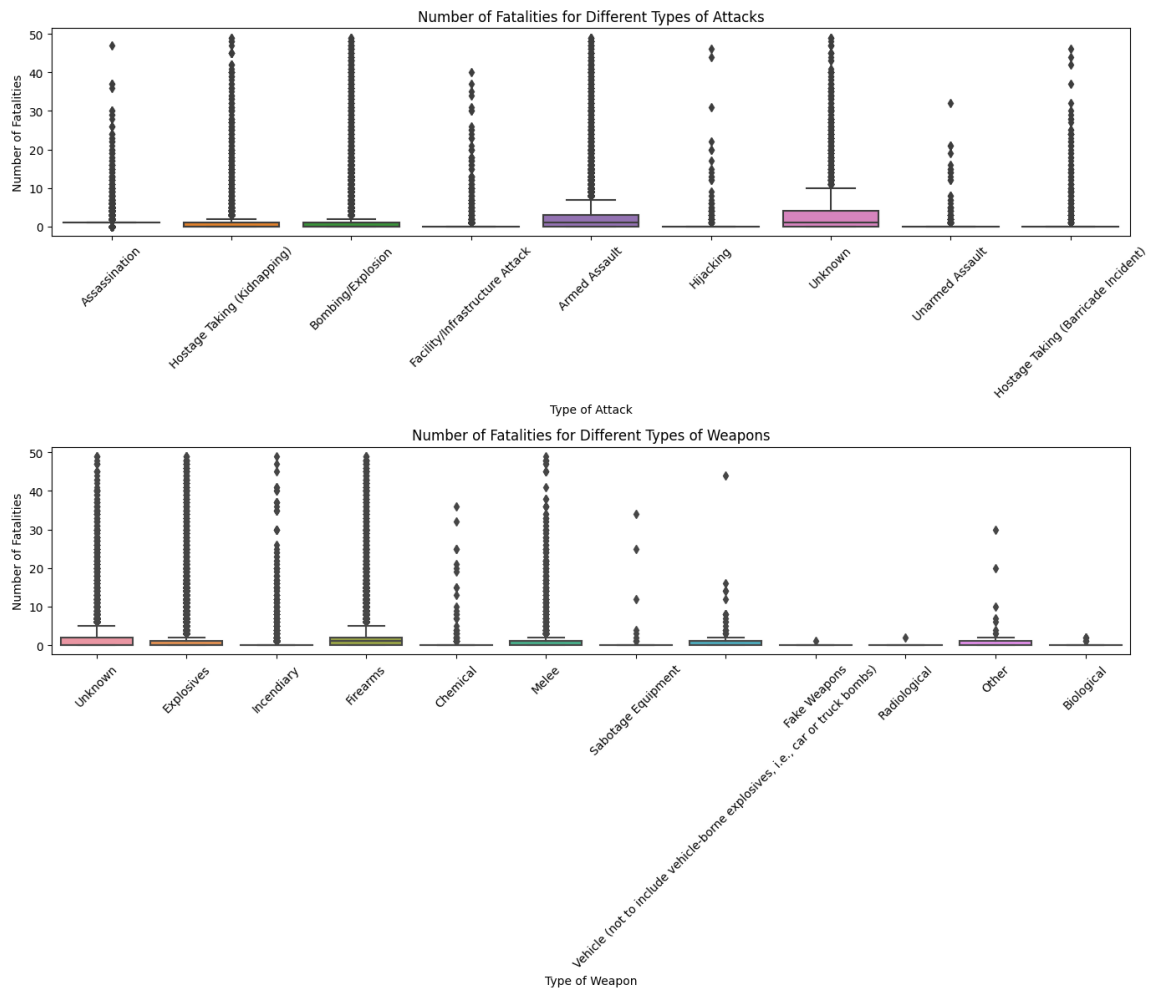
```
Out[ ]: Index(['Eventid', 'Iyear', 'Imonth', 'Iday', 'Extended', 'Country',
              'Country_Txt', 'Region', 'Region_Txt', 'Provstate', 'City', 'Latitude',
              'Longitude', 'Specificity', 'Vicinity', 'Summary', 'Crit1', 'Crit2',
              'Crit3', 'Doubtterr', 'Multiple', 'Success', 'Suicide', 'Attacktype1',
              'Attacktype1_Txt', 'Targtype1', 'Targtype1_Txt', 'Targsubtype1',
              'Targsubtype1_Txt', 'Corp1', 'Target1', 'Natlty1', 'Natlty1_Txt',
              'Gname', 'Guncertain1', 'Individual', 'Nperps', 'Nperpcap', 'Claimed',
              'Weaptype1', 'Weaptype1_Txt', 'Weapsubtype1', 'Weapsubtype1_Txt',
              'Weapdetail', 'Nkill', 'Nkillus', 'Nkillter', 'Nwound', 'Nwoundus',
              'Nwoundte', 'Property', 'Ishostkid', 'Scite1', 'Dbsource', 'Int_Log',
              'Int_Ideo', 'Int_Misc', 'Int_Any'],
              dtype='object')
```

```
In [ ]: # Create box plots of the number of fatalities for different types of attacks and
fig, ax = plt.subplots(2, 1, figsize=(14, 12))

# Box plot for type of attack
sns.boxplot(data=df[df['Nkill'] < 50], x='Attacktype1_Txt', y='Nkill', ax=ax[0])
ax[0].set_title('Number of Fatalities for Different Types of Attacks')
ax[0].set_xlabel('Type of Attack')
ax[0].set_ylabel('Number of Fatalities')
ax[0].tick_params(axis='x', rotation=45)

# Box plot for type of weapon
sns.boxplot(data=df[df['Nkill'] < 50], x='Weaptype1_Txt', y='Nkill', ax=ax[1])
ax[1].set_title('Number of Fatalities for Different Types of Weapons')
ax[1].set_xlabel('Type of Weapon')
ax[1].set_ylabel('Number of Fatalities')
ax[1].tick_params(axis='x', rotation=45)

# Adjust the layout
plt.tight_layout()
plt.show()
```



What can we find with this box plot

Some insights from these plots are:

- For attack types, bombings/explosions, armed assault, and hijacking tend to result in a higher number of fatalities.
- For weapon types, explosives and firearms tend to result in a higher number of fatalities.

Group analysis

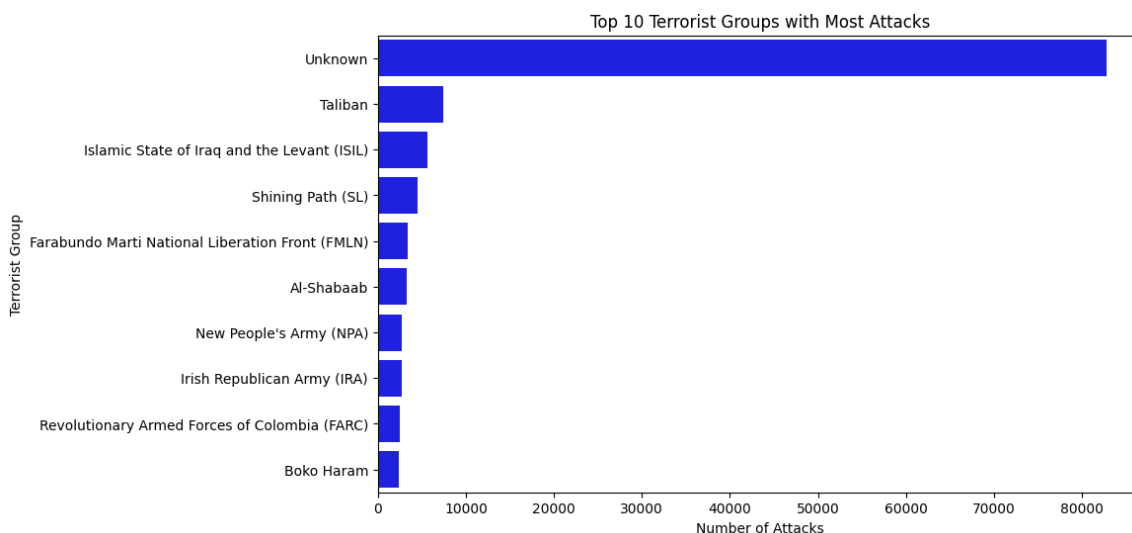
```
In [ ]: # Calculate the number of attacks for each terrorist group
group_attacks = df['Gname'].value_counts()
group_attacks
```

```
Out[ ]: Unknown                82782
        Taliban                7478
        Islamic State of Iraq and the Levant (ISIL)  5613
        Shining Path (SL)      4555
        Farabundo Marti National Liberation Front (FMLN) 3351
        ...
        Ansar Sarallah         1
        Sword of Islam         1
        Support of Ocalan-The Hawks of Thrace      1
        Arab Revolutionary Front 1
        MANO-D                 1
        Name: Gname, Length: 3537, dtype: int64
```

```
In [ ]: # Get the top 10 terrorist groups with the most attacks
        top_groups = group_attacks.head(10)
        top_groups
```

```
Out[ ]: Unknown                82782
        Taliban                7478
        Islamic State of Iraq and the Levant (ISIL)  5613
        Shining Path (SL)      4555
        Farabundo Marti National Liberation Front (FMLN) 3351
        Al-Shabaab             3288
        New People's Army (NPA) 2772
        Irish Republican Army (IRA) 2671
        Revolutionary Armed Forces of Colombia (FARC) 2487
        Boko Haram             2418
        Name: Gname, dtype: int64
```

```
In [ ]: # Plot the number of attacks for the top 10 terrorist groups
        plt.figure(figsize=(10,6))
        sns.barplot(x=top_groups.values, y=top_groups.index, color='b', orient='h')
        plt.title('Top 10 Terrorist Groups with Most Attacks')
        plt.xlabel('Number of Attacks')
        plt.ylabel('Terrorist Group')
        plt.show()
```



Some insights from this plot are:

- The group labeled as "Unknown" has carried out the most attacks. This label is used when the group responsible for an attack could not be determined.

- Among the known groups, the Taliban, ISIL (Islamic State of Iraq and the Levant), and SL (Shining Path) have carried out the most attacks.

```
In [ ]: # Get the top 5 types of attacks and weapons
top_attacks = df['Attacktype1_Txt'].value_counts().head(5).index
top_weapons = df['Weaptype1_Txt'].value_counts().head(5).index
```

```
In [ ]: top_attacks
```

```
Out[ ]: Index(['Bombing/Explosion', 'Armed Assault', 'Assassination',
              'Hostage Taking (Kidnapping)', 'Facility/Infrastructure Attack'],
             dtype='object')
```

```
In [ ]: top_weapons
```

```
Out[ ]: Index(['Explosives', 'Firearms', 'Unknown', 'Incendiary', 'Melee'], dtype='object')
```

```
In [ ]: # Filter the data for these top 5 types of attacks and weapons
df_top_attacks_weapons = df[df['Attacktype1_Txt'].isin(top_attacks) & df['Weaptype1_Txt'].isin(top_weapons)]
df_top_attacks_weapons
```


Out[]:

| | Eventid | Iyear | Imonth | Iday | Extended | Country | Country_Txt | Region | Region_ |
|--------|---------------|-------|--------|------|----------|---------|--------------------|--------|-----------------------------|
| 0 | 1970000000001 | 1970 | 7 | 2 | 0 | 58 | Dominican Republic | 2 | Central America & Caribbean |
| 1 | 1970000000002 | 1970 | 0 | 0 | 0 | 130 | Mexico | 1 | North America |
| 2 | 1970010000001 | 1970 | 1 | 0 | 0 | 160 | Philippines | 5 | Southeast Asia |
| 3 | 1970010000002 | 1970 | 1 | 0 | 0 | 78 | Greece | 8 | Western Europe |
| 4 | 1970010000003 | 1970 | 1 | 0 | 0 | 101 | Japan | 4 | East Asia |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 181686 | 201712310022 | 2017 | 12 | 31 | 0 | 182 | Somalia | 11 | Sub-Saharan Africa |
| 181687 | 201712310029 | 2017 | 12 | 31 | 0 | 200 | Syria | 10 | Middle East & North Africa |
| 181688 | 201712310030 | 2017 | 12 | 31 | 0 | 160 | Philippines | 5 | Southeast Asia |
| 181689 | 201712310031 | 2017 | 12 | 31 | 0 | 92 | India | 6 | South Asia |
| 181690 | 201712310032 | 2017 | 12 | 31 | 0 | 160 | Philippines | 5 | Southeast Asia |

171374 rows × 58 columns

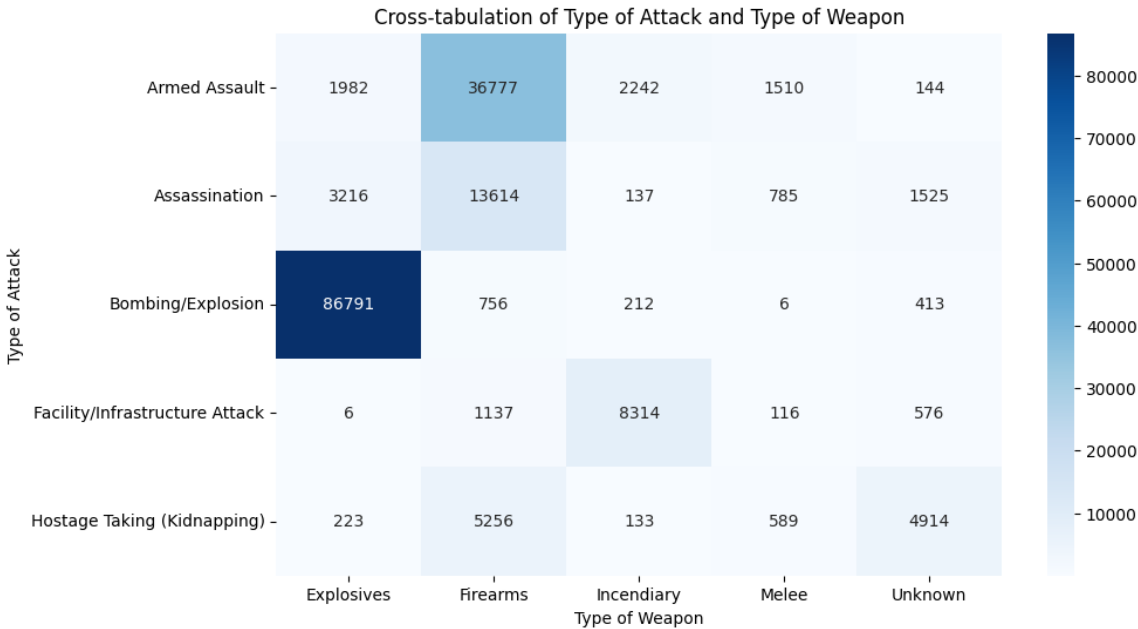
```
In [ ]: # Create a cross-tabulation of the type of attack and the type of weapon
cross_tab = pd.crosstab(df_top_attacks_weapons['Attacktype1_Txt'], df_top_attacks_weapons['Weapon1_Txt'])
```

Out[]:

| Weaptype1_Txt | Explosives | Firearms | Incendiary | Melee | Unknown |
|--------------------------------|------------|----------|------------|-------|---------|
| Attacktype1_Txt | | | | | |
| Armed Assault | 1982 | 36777 | 2242 | 1510 | 144 |
| Assassination | 3216 | 13614 | 137 | 785 | 1525 |
| Bombing/Explosion | 86791 | 756 | 212 | 6 | 413 |
| Facility/Infrastructure Attack | 6 | 1137 | 8314 | 116 | 576 |
| Hostage Taking (Kidnapping) | 223 | 5256 | 133 | 589 | 4914 |

In []:

```
# Plot the cross-tabulation as a heatmap
plt.figure(figsize=(10,6))
sns.heatmap(cross_tab, annot=True, fmt='d', cmap='Blues')
plt.title('Cross-tabulation of Type of Attack and Type of Weapon')
plt.xlabel('Type of Weapon')
plt.ylabel('Type of Attack')
plt.show()
```



This heatmap represents the cross-tabulation of the types of attacks and the types of weapons. Each cell in the heatmap shows the number of terrorist events for a specific combination of attack type and weapon type. The darker the color, the higher the number of events.

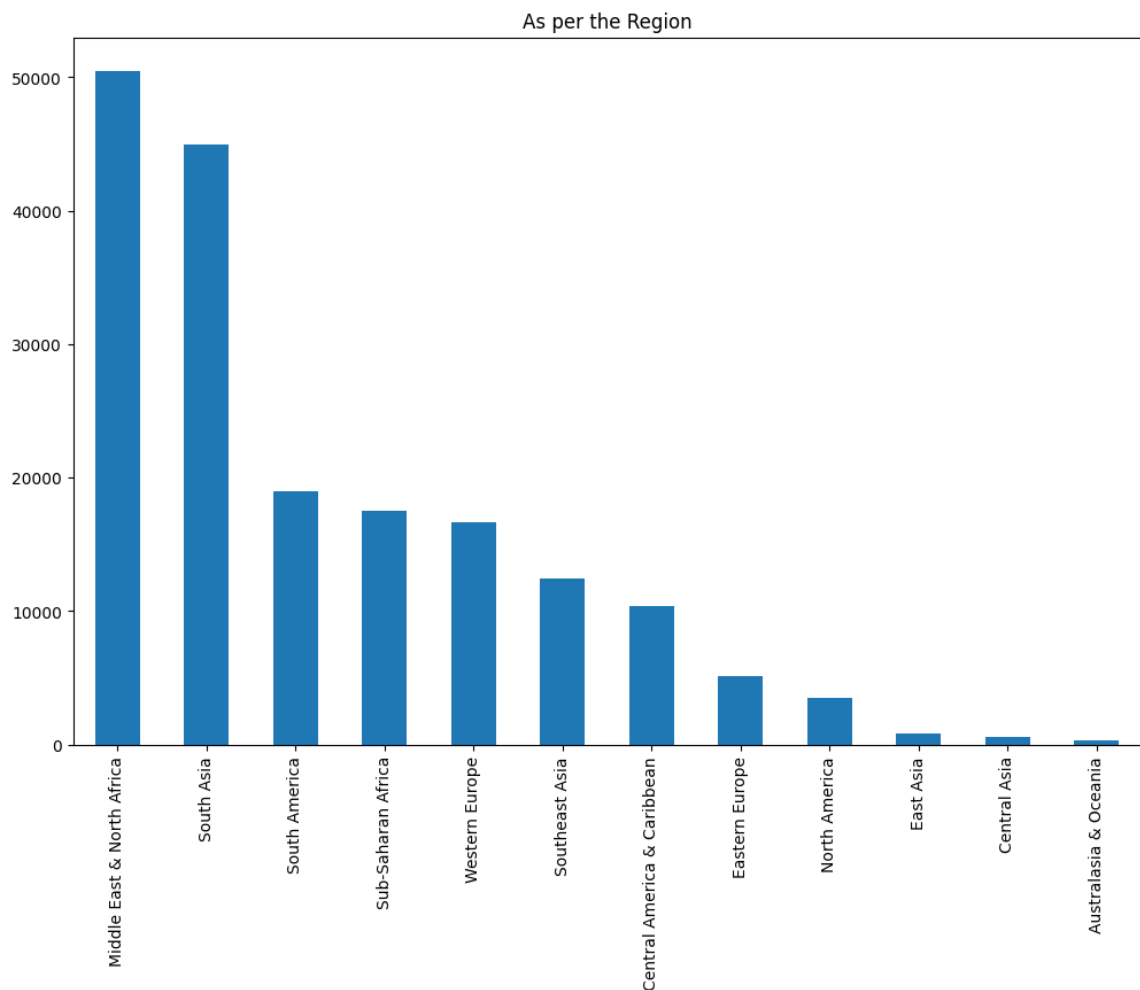
Here are some insights from the heatmap:

- Explosives are most commonly used in bombings and explosions. This is expected because the very definition of these types of attacks involves the use of explosives.
- Firearms are frequently used in armed assaults and assassinations. This is also intuitive as these types of attacks often involve direct confrontation with the targets.
- Incendiary devices are often used in facility and infrastructure attacks, which might involve arson or other methods to cause property damage.

```
In [ ]: plt.figure(figsize=(12,8))

# plotting the graff with Region
df['Region Txt'].value_counts().plot(kind='bar', title='As per the Region')
```

```
Out[ ]: <Axes: title={'center': 'As per the Region'}>
```



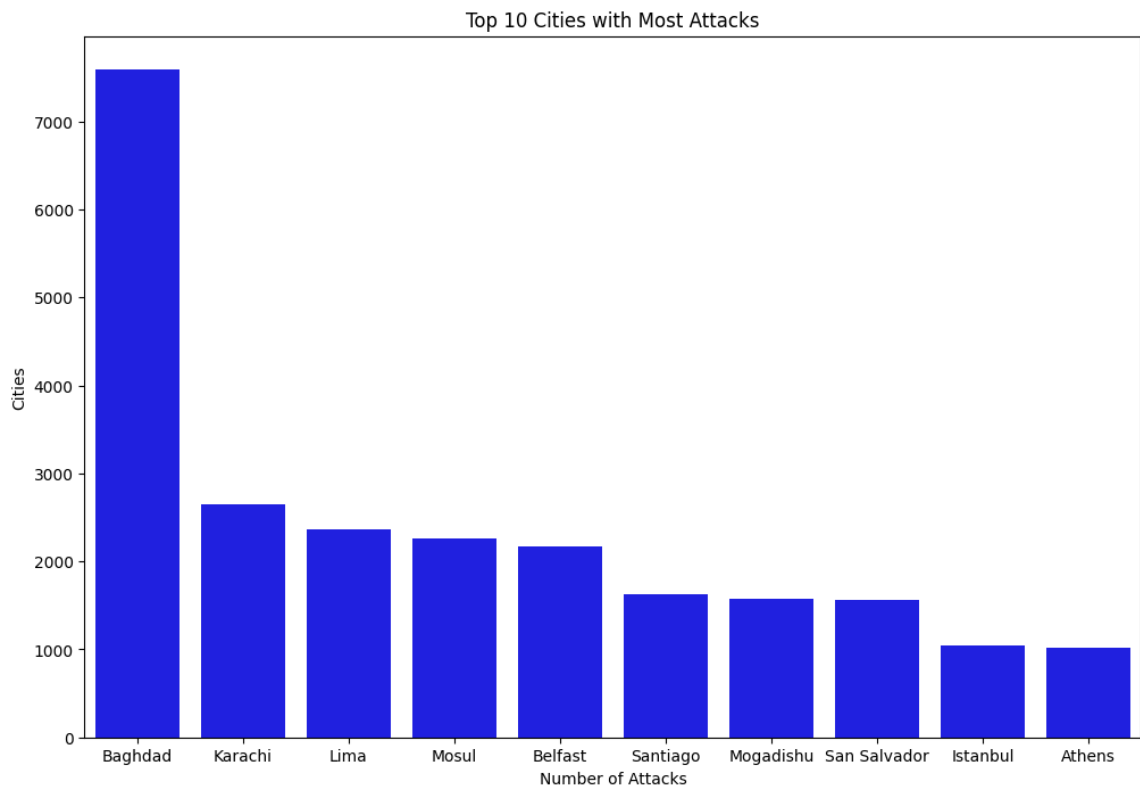
```
In [ ]: # counting the city
df['City'].value_counts()
```

```
Out[ ]: Unknown      10209
Baghdad       7589
Karachi       2652
Lima          2359
Mosul         2265
...
Hotwag         1
Ostend         1
Balughata      1
Jikoyi         1
Kubentog       1
Name: City, Length: 36674, dtype: int64
```

```
In [ ]: # filter the top 10 city who faced most terrorist attack in the world
top10_city = df['City'].value_counts()[1:].head(10)
top10_city
```

```
Out[ ]: Baghdad      7589
Karachi      2652
Lima         2359
Mosul        2265
Belfast      2171
Santiago     1621
Mogadishu    1581
San Salvador 1558
Istanbul     1048
Athens       1019
Name: City, dtype: int64
```

```
In [ ]: # Plot the number of attacks for the top 10 terrorist groups
plt.figure(figsize=(12,8))
sns.barplot(x=top10_city.index, y=top10_city.values, color='b')
plt.title('Top 10 Cities with Most Attacks')
plt.xlabel('Number of Attacks')
plt.ylabel('Cities')
plt.show()
```



What we get from this chart

- Baghdad and Karachi has faced most attacked

```
In [ ]: # Get the top 5 regions and weapons
top_regions = df['Region'].value_counts().head(5).index
top_weapons = df['Weaptype1_Txt'].value_counts().head(5).index
```

```
In [ ]: top_regions
```

```
Out[ ]: Int64Index([10, 6, 3, 11, 8], dtype='int64')
```

```
In [ ]: top_weapons
```

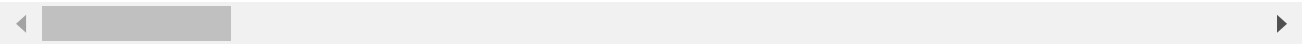
```
Out[ ]: Index(['Explosives', 'Firearms', 'Unknown', 'Incendiary', 'Melee'], dtype='object')
```

```
In [ ]: # Filter the data for these top 5 regions and weapons  
df_top_regions_weapons = df[df['Region'].isin(top_regions) & df['Weaptype1_Txt']  
df_top_regions_weapons
```

Out[]:

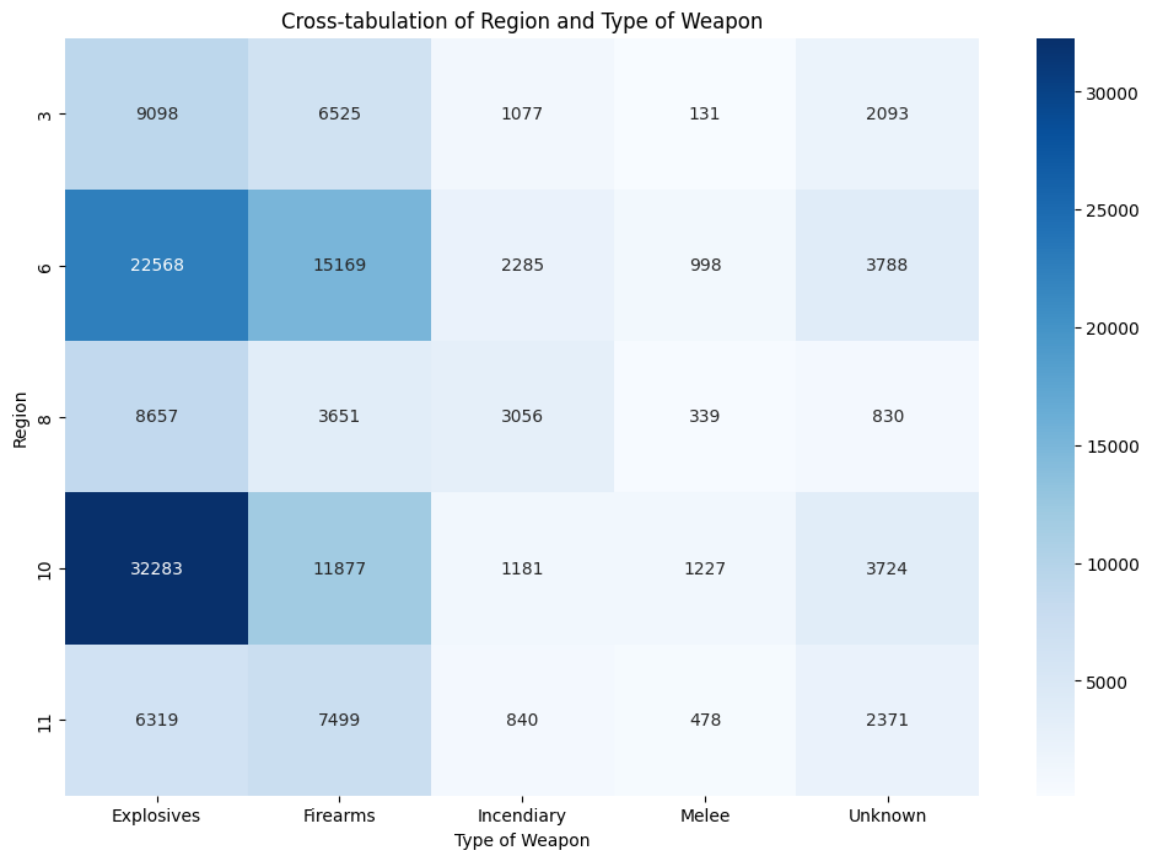
| | Eventid | Iyear | Imonth | Iday | Extended | Country | Country_Txt | Region | Region_ |
|--------|--------------|-------|--------|------|----------|---------|-------------|--------|-----------------|
| 3 | 197001000002 | 1970 | 1 | 0 | 0 | 78 | Greece | 8 | West Eur |
| 6 | 197001020001 | 1970 | 1 | 2 | 0 | 218 | Uruguay | 3 | So Ame |
| 12 | 197001080001 | 1970 | 1 | 8 | 0 | 98 | Italy | 8 | West Eur |
| 16 | 197001110001 | 1970 | 1 | 11 | 0 | 65 | Ethiopia | 11 | S Saha Af |
| 21 | 197001150001 | 1970 | 1 | 15 | 0 | 218 | Uruguay | 3 | So Ame |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 181684 | 201712310019 | 2017 | 12 | 31 | 0 | 92 | India | 6 | South / |
| 181685 | 201712310020 | 2017 | 12 | 31 | 0 | 4 | Afghanistan | 6 | South / |
| 181686 | 201712310022 | 2017 | 12 | 31 | 0 | 182 | Somalia | 11 | S Saha Af |
| 181687 | 201712310029 | 2017 | 12 | 31 | 0 | 200 | Syria | 10 | Middle E & N Af |
| 181689 | 201712310031 | 2017 | 12 | 31 | 0 | 92 | India | 6 | South / |

148064 rows × 58 columns



```
In [ ]: # Create a cross-tabulation of the region and the type of weapon
cross_tab = pd.crosstab(df_top_regions_weapons['Region'], df_top_regions_weapons

In [ ]: # Plot the cross-tabulation as a heatmap
plt.figure(figsize=(12,8))
sns.heatmap(cross_tab, annot=True, fmt='d', cmap='Blues')
plt.title('Cross-tabulation of Region and Type of Weapon')
plt.xlabel('Type of Weapon')
plt.ylabel('Region')
plt.show()
```



What we get from this heatmap

Here are some insights from the heatmap:

- In the Middle East and North Africa, explosives are by far the most commonly used weapon. This might be related to the prevalence of certain types of attacks in this region, such as bombings.
- Firearms are widely used in South Asia, Sub-Saharan Africa, and South America, although not as extensively as explosives in the Middle East and North Africa.
- Incendiary weapons appear to be more commonly used in Western Europe compared to other regions. This could reflect the fact that these weapons can cause significant disruption and attract media attention, which might be a strategic goal of terrorist groups operating in these regions.
- The category 'Unknown' for weapon type is most prevalent in South America. This might suggest that information about the type of weapon used is often unavailable or not reported for incidents in this region.

```
In [ ]: df.sample(2)
```

Out[]:

| | Eventid | Iyear | Imonth | Iday | Extended | Country | Country_Txt | Region | Region_ |
|--|---------|-------|--------|------|----------|---------|-------------|--------|---------|
|--|---------|-------|--------|------|----------|---------|-------------|--------|---------|

| | | | | | | | | | |
|--------|--------------|------|---|----|---|-----|----------|---|--------|
| 114530 | 201302170017 | 2013 | 2 | 17 | 0 | 205 | Thailand | 5 | Southe |
|--------|--------------|------|---|----|---|-----|----------|---|--------|

| | | | | | | | | | |
|-------|--------------|------|---|----|---|-----|----------|---|--------|
| 86419 | 200804150031 | 2008 | 4 | 15 | 0 | 205 | Thailand | 5 | Southe |
|-------|--------------|------|---|----|---|-----|----------|---|--------|