# *Global Terrorism Dataset*


## *Context*

Information on more than 180,000 Terrorist Attacks The Global Terrorism Database (GTD) is an open-source database including information on terrorist attacks around the world from 1970 through 2017. The GTD includes systematic data on domestic as well as international terrorist incidents that have occurred during this time period and now includes more than 180,000 attacks. The database is maintained by researchers at the National Consortium for the Study of Terrorism and Responses to Terrorism (START), headquartered at the University of Maryland. For more information - https://www.start.umd.edu/gtd/

## *Content*

Geography: Worldwide Time period: 1970-2017, except 1993 Unit of analysis: Attack Variables: >100 variables on location, tactics, perpetrators, targets, and outcomes Sources: Unclassified media articles (Note: Please interpret changes over time with caution. Global patterns are driven by diverse trends in particular regions, and data collection is influenced by fluctuations in access to media coverage over both time and place.) Definition of terrorism: "The threatened or actual use of illegal force and violence by a non-state actor to attain a political, economic, religious, or social goal through fear, coercion, or intimidation." See the GTD Codebook, - https://www.start.umd.edu/gtd/downloads/Codebook.pdf - for important details on data collection methodology, definitions, and coding schema.

## *Acknowledgements*

The Global Terrorism Database is funded through START, by the US Department of State (Contract Number: SAQMMA12M1292) and the US Department of Homeland Security Science and Technology Directorate's Office of University Programs (Award Number 2012-ST-061-CS0001, CSTAB 3.1). The coding decisions and classifications contained in the database are determined independently by START researchers and should not be interpreted as necessarily representing the official views or policies of the United States Government.

## Imports & creating the data frame

[2]:
```
import numpy as np
import pandas as pd
from matplotlib import pyplot as plt
import seaborn as sns
import plotly.express as px
from plotly.subplots import make_subplots
```

[3]:
```
pd.set_option('display.max_rows',100)
pd.set_option('display.max_columns',150)
sns.set_style("ticks")
```

[4]:
```
df = pd.read_csv('/kaggle/input/gtd/globalterrorismdb_0718dist.csv', encoding = "ISO-8859-1", low_memory=False)
df.shape
```

[4]: (181691, 135)

---

## Resorting the data and renaming the columns

[5]:
```
df = df[['iyear','country','country_txt','region','region_txt','city','alternative','alternative_txt','success','suicide','at
    'corp1','target1','natlty1','natlty1_txt','gname','nperps','claimed','claimmode','claimmode_txt','weaptype1','weaptype1_t
    'nkill','nwound','property','propextent','propextent_txt','propvalue','propcomment','ishostkid','nhostkid','nhours','nday
    'ransom','ransomamt','ransompaid','hostkidoutcome','hostkidoutcome_txt','nreleased']]
```

[6]:

```
df.rename(columns = {'iyear':'year',
                     'country':'country_id',
                     'country_txt': 'country_name',
                     'region':'region_id',
                     'region_txt':'region_name',
                     'alternative':'terror_action_id',
                     'alternative_txt':'terror_action',
                     'success':'attack_was_successful',
                     'suicide':'attack_commited_suicide',
                     'attacktype1':'attack_type_id',
                     'attacktype1_txt':'attack_type',
                     'targtype1':'target_type_id',
                     'targtype1_txt':'target_type',
                     'targsubtype1':'target_sub_type_id',
                     'targsubtype1_txt':'target_sub_type',
                     'corp1':'corporation_was_attacked',
                     'target1':'attack_target',
                     'natlty1':'attacked_state_id',
                     'natlty1_txt':'attacked_state',
                     'gname':'terror_group',
                     'nperps':'num_of_terrorists',
                     'claimed':'terror_group_claimed_attacks',
                     'claimmode':'claim_id',
                     'claimmode_txt':'claim_method',
                     'weaptype1':'weapon_type_id',
                     'weaptype1_txt':'weapon_type',
                     'weapsubtype1':'weapon_sub_type_id',
                     'weapsubtype1_txt':'weapon_type_specific ',
                     'weapdetail':'weapon',
                     'nkill':'confirmed_fatalities',
                     'nwound':'num_of_woundeds',
                     'property':'damage_to_property',
                     'propextent':'property_damages_id',
                     'propextent_txt':'property_damages',
                     'propvalue':'property_damage_values',
                     'propcomment':'specific_items',
                     'ishostkid':'hostages_kids',
                     'nhostkid':'num_of_kids_hostages',
                     'nhours':'duration_in_hours',
                     'ndays':'duration_in_days',
                     'kidhijcountry':'country_kidnapping_occurred',
                     'ransom':'was_there_ransom',
                     'ransomamt':'ransom_amount',
                     'ransompaid':'ransom_paid',
                     'hostkidoutcome':'kidnap_outcome_id',
                     'hostkidoutcome_txt':'kidnap_outcome',
                     'nreleased':'num_of_kidnapped_released'},
          inplace = True)
```

## See if column names have changed

[32]:
```
df.head()
```

[32]:

| | year | country_id | country_name | region_id | region_name | city | terror_action_id | terror_action | attack_was_successful | attack_commited_suicide | attack_type_id | atta |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1970 | 58 | Dominican Republic | 2 | Central America & Caribbean | Santo Domingo | Unattainable Information | Unattainable Information | 1 | 0 | 1 | Assas |
| 1 | 1970 | 130 | Mexico | 1 | North America | Mexico city | Unattainable Information | Unattainable Information | 1 | 0 | 6 | Hostage (Kidn |
| 2 | 1970 | 160 | Philippines | 5 | Southeast Asia | Unknown | Unattainable Information | Unattainable Information | 1 | 0 | 1 | Assas |
| 3 | 1970 | 78 | Greece | 8 | Western Europe | Athens | Unattainable Information | Unattainable Information | 1 | 0 | 3 | Bombing/Ex |
| 4 | 1970 | 101 | Japan | 4 | East Asia | Fukouka | Unattainable Information | Unattainable Information | 1 | 0 | 7 | Facility/Infrast |

---

## Replacing nulls & NaN

[8]:
```
ui = df.fillna('Unattainable Information', inplace=True)
```

## See where we have unknown values

```
c =df.columns
cols = df[c]=='Unknown'
cols.sum().index
```

[33]:
```
Index(['year', 'country_id', 'country_name', 'region_id', 'region_name',
       'city', 'terror_action_id', 'terror_action', 'attack_was_successful',
       'attack_commited_suicide', 'attack_type_id', 'attack_type',
       'target_type_id', 'target_type', 'target_sub_type_id',
       'target_sub_type', 'corporation_was_attacked', 'attack_target',
       'attacked_state_id', 'attacked_state', 'terror_group',
       'num_of_terrorists', 'terror_group_claimed_attacks', 'claim_id',
       'claim_method', 'weapon_type_id', 'weapon_type', 'weapon_sub_type_id',
       'weapon_type_specific ', 'weapon', 'confirmed_fatalities',
       'num_of_woundeds', 'damage_to_property', 'property_damages_id',
       'property_damages', 'property_damage_values', 'specific_items',
       'hostages_kids', 'num_of_kids_hostages', 'duration_in_hours',
       'duration_in_days', 'country_kidnapping_occurred', 'was_there_ransom',
       'ransom_amount', 'ransom_paid', 'kidnap_outcome_id', 'kidnap_outcome',
       'num_of_kidnapped_released', 'num_of_attacks'],
      dtype='object')
```

+ Code + Markdown

## Top 10 unknown attacks

- Instead of having an unknown reason for the attacks

[10]:
```
unknown_attacks = df[['attacked_state','attack_type']]
unknown_attacks = unknown_attacks.loc[unknown_attacks['attack_type']=='Unknown']
top_10_unknown_attacks=unknown_attacks[['attacked_state','attack_type']].groupby(
    ['attacked_state']).count().sort_values(by='attack_type', ascending=False).head(10)
top_10_unknown_attacks=top_10_unknown_attacks.sort_values(by='attack_type', ascending=False)
top_10_unknown_attacks
```

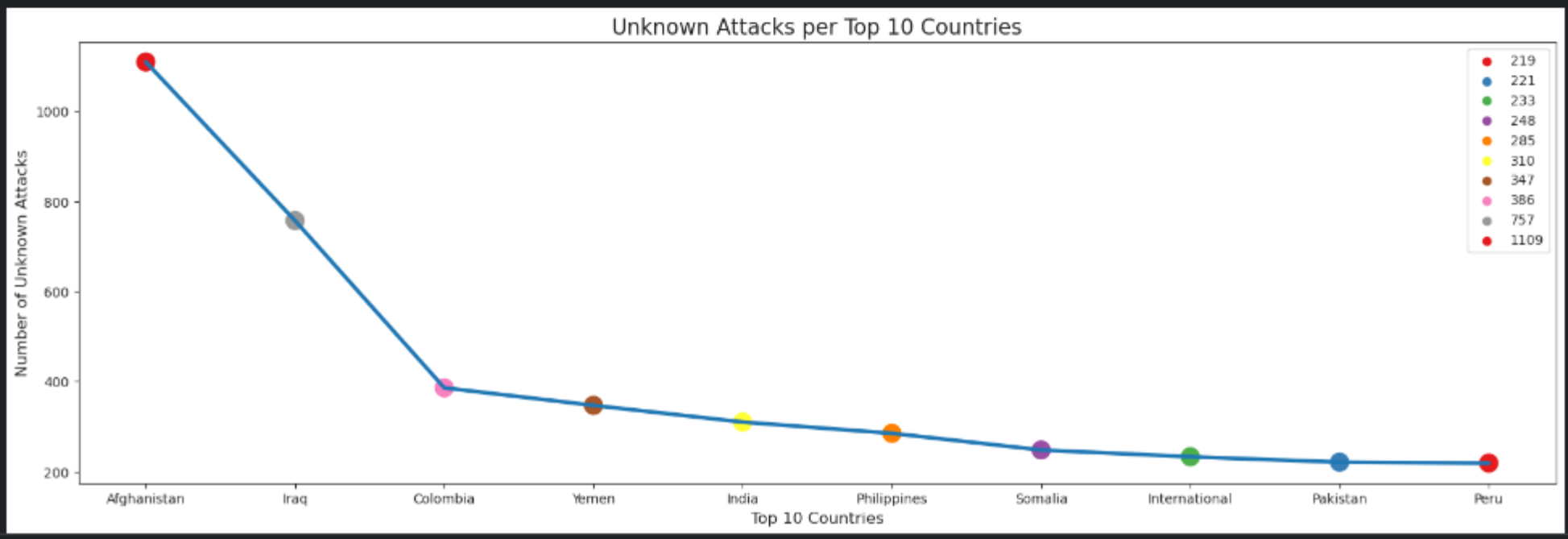
[10]:

| attacked_state | attack_type |
|---|---|
| Afghanistan | 1109 |
| Iraq | 757 |
| Colombia | 386 |
| Yemen | 347 |
| India | 310 |
| Philippines | 285 |
| Somalia | 248 |
| International | 233 |
| Pakistan | 221 |
| Peru | 219 |

## Graph

[11]:
```
f, ax = plt.subplots(figsize=(20, 6))
sns.scatterplot(top_10_unknown_attacks, x='attacked_state', y='attack_type', s=250, hue='attack_type', palette="Set1")
sns.lineplot(top_10_unknown_attacks, x='attacked_state', y='attack_type', linewidth=3)
plt.xlabel('Top 10 Countries', fontsize=12)
plt.ylabel('Number of Unknown Attacks', fontsize=12)
plt.title('Unknown Attacks per Top 10 Countries', fontsize=16)
```

[11]: Text(0.5, 1.0, 'Unknown Attacks per Top 10 Countries')



## Counting terrorist attacks in the top 15 country

- Counting the states the attack occured

```
countries_attacked=df[['attacked_state','terror_group','attack_type']]
top_15_attacked_country = countries_attacked['attacked_state'].groupby(countries_attacked['attacked_state'])\
.count().sort_values(ascending=False).head(15)
countries_attacked[['attacked_state','terror_group']].groupby(['attacked_state']).count()\
.sort_values(by='terror_group', ascending=False).head(15)
```

[12...

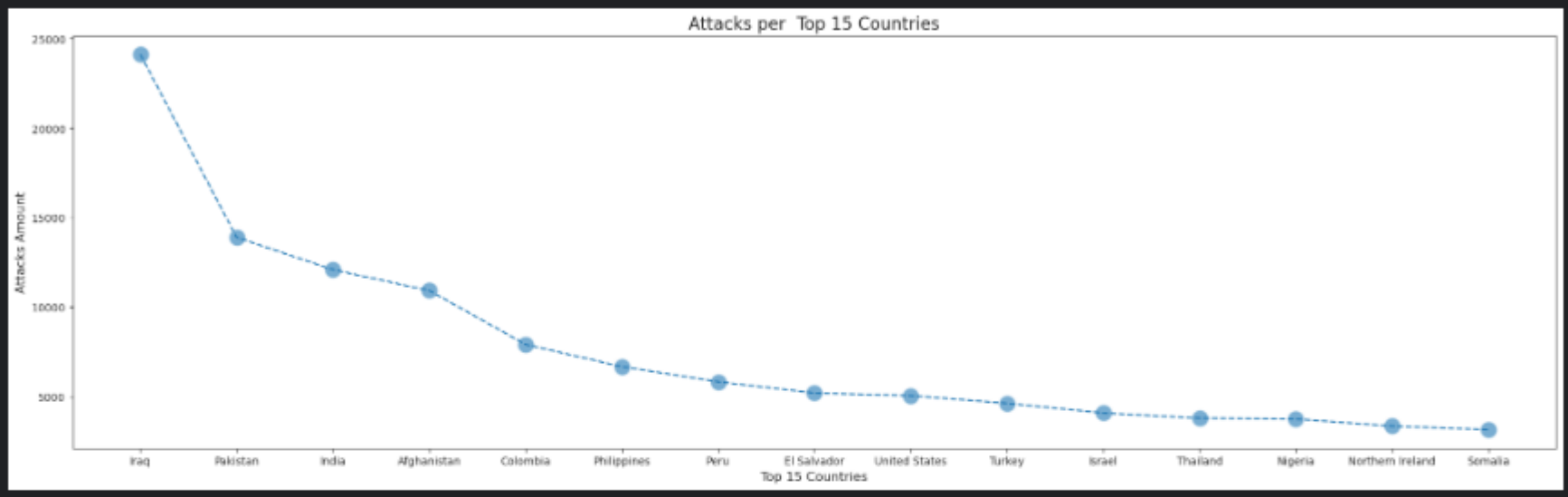
| attacked_state | terror_group |
|---|---|
| Iraq | 24113 |
| Pakistan | 13900 |
| India | 12098 |
| Afghanistan | 10931 |
| Colombia | 7922 |
| Philippines | 6685 |
| Peru | 5840 |
| El Salvador | 5212 |
| United States | 5065 |
| Turkey | 4636 |
| Israel | 4097 |
| Thailand | 3804 |
| Nigeria | 3759 |
| Northern Ireland | 3367 |
| Somalia | 3160 |

+ Code + Markdown

## Graph

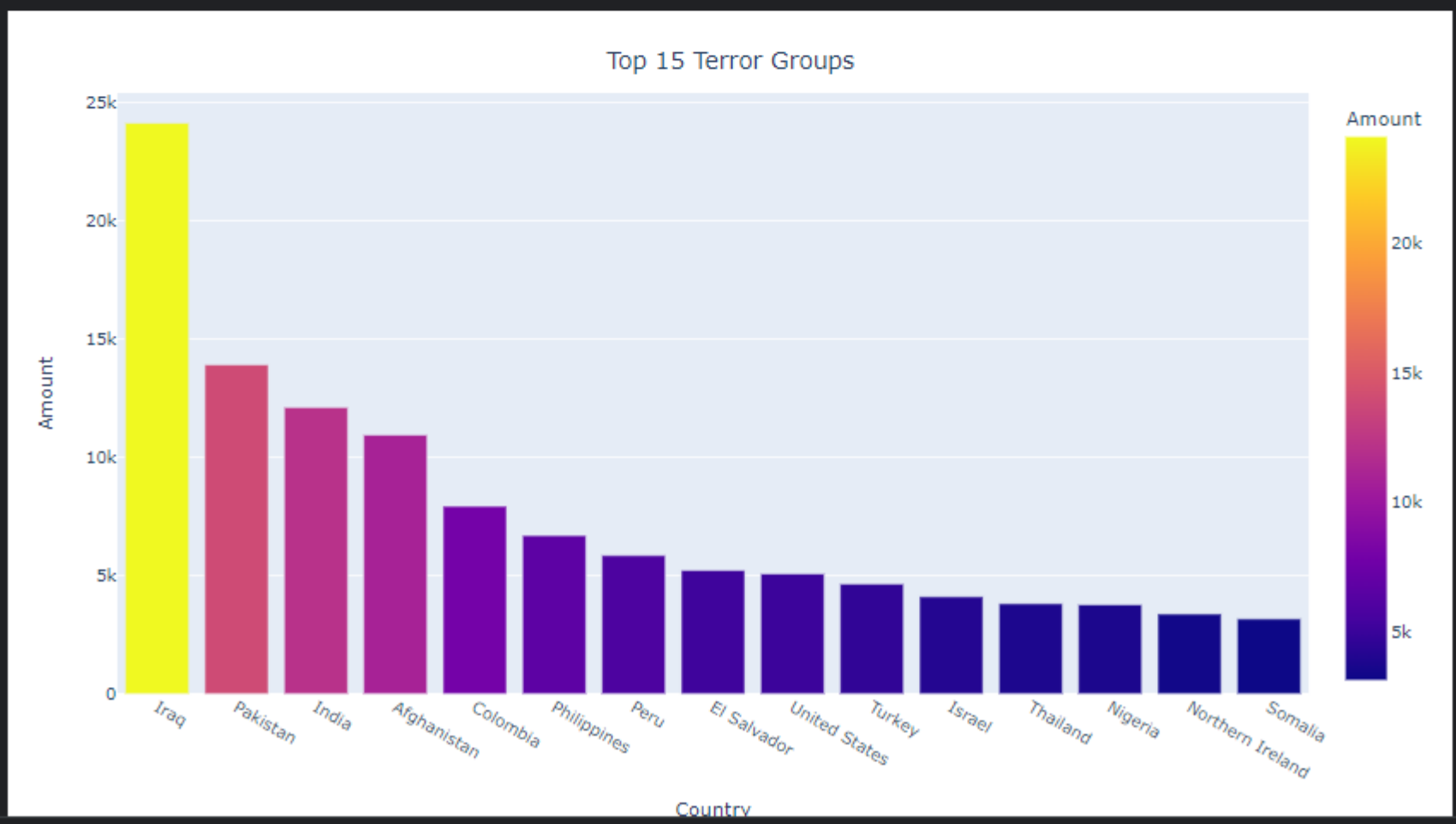
[13]:
```
f, ax = plt.subplots(figsize=(25, 7))
sns.lineplot(top_15_attacked_country,linewidth = 1.5, linestyle='dashed')
sns.scatterplot(top_15_attacked_country, legend=False, alpha=0.6, s=250)
x = plt.xlabel('Top 15 Countries', fontsize=12)
y = plt.ylabel('Attacks Amount', fontsize=12)
plt.title('Attacks per  Top 15 Countries', fontsize=16)
```

[13_ `Text(0.5, 1.0, 'Attacks per  Top 15 Countries')`




## Graph

```
a = px.bar(top_15_attacked_country,color=top_15_attacked_country,
           labels={'index':'Country','value':'Amount', 'color':"Amount"},height=600)

a.update_layout(
    title={'text': "Top 15 Terror Groups", 'y':0.95, 'x':0.5, 'xanchor': 'center', 'yanchor': 'top'})

a.show()
```



## Counting attack types

- Attack types and their amount

[16]:
```
df['num_of_attacks'] = df['attack_type']
attacks = df[['attack_type','num_of_attacks']]
attacks = attacks[['num_of_attacks']].groupby(attacks['attack_type']).count()
attacks = attacks.drop('Unknown')
```

[17]:
```
attacks.sort_values('num_of_attacks', ascending=False)
```

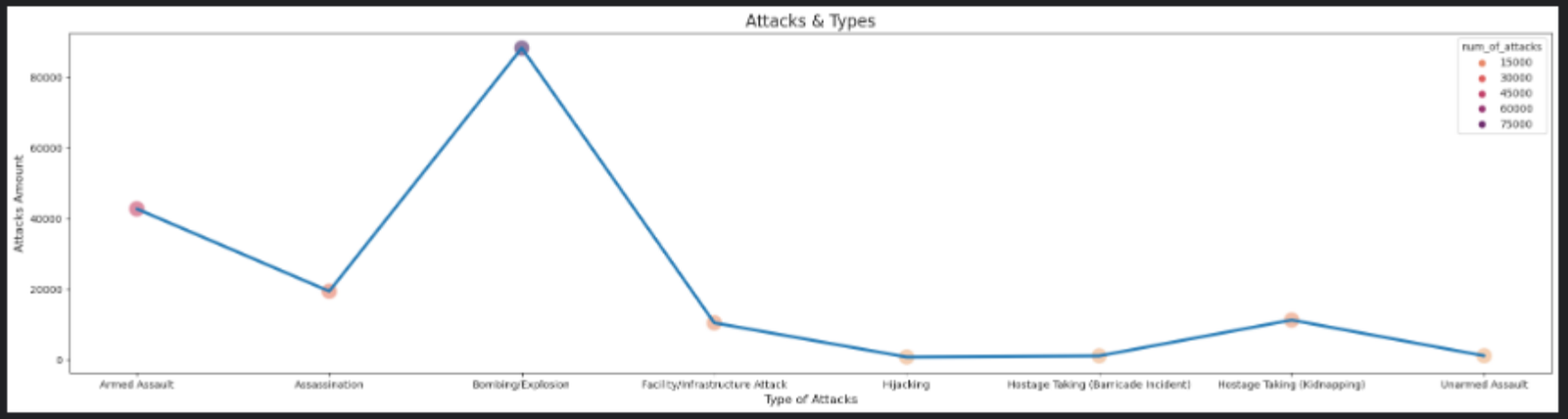
[17_

| attack_type | num_of_attacks |
|---|---|
| Bombing/Explosion | 88255 |
| Armed Assault | 42669 |
| Assassination | 19312 |
| Hostage Taking (Kidnapping) | 11158 |
| Facility/Infrastructure Attack | 10356 |
| Unarmed Assault | 1015 |
| Hostage Taking (Barricade Incident) | 991 |
| Hijacking | 659 |

## Graph

[18]:
```
f, ax = plt.subplots(figsize=(26, 6))
sns.lineplot(attacks, legend=False, linewidth=3)
sns.scatterplot(attacks, x='attack_type', y='num_of_attacks', legend=True, hue='num_of_attacks', palette='flare', alpha=0.6,
plt.xlabel('Type of Attacks', fontsize=12)
plt.ylabel('Attacks Amount', fontsize=12)
plt.title('Attacks & Types', fontsize=16)
```

[18_ `Text(0.5, 1.0, 'Attacks & Types')`



## Terrorist attacks success rate in %

[19]:
```
successful_attacks = df.loc[df['attack_was_successful']==1].count()
total_attacks = df.loc[df['attack_was_successful']].count()

success_rate = successful_attacks/total_attacks*100
success_rate = success_rate['attack_was_successful'].round()
print(f'Terrorist attacks were successful',success_rate,'%')
```

```
Terrorist attacks were successful 89.0 %
```

## Terrorist attacks failed rate in %

[20]:
```
failed_attacks = df.loc[df['attack_was_successful']==0].count()

failed_rate = failed_attacks/total_attacks*100
failed_rate = failed_rate['attack_was_successful'].round()
print(f'Terrorist attacks were failed',failed_rate,'%')
```

```
Terrorist attacks were failed 11.0 %
```

## Counting target type

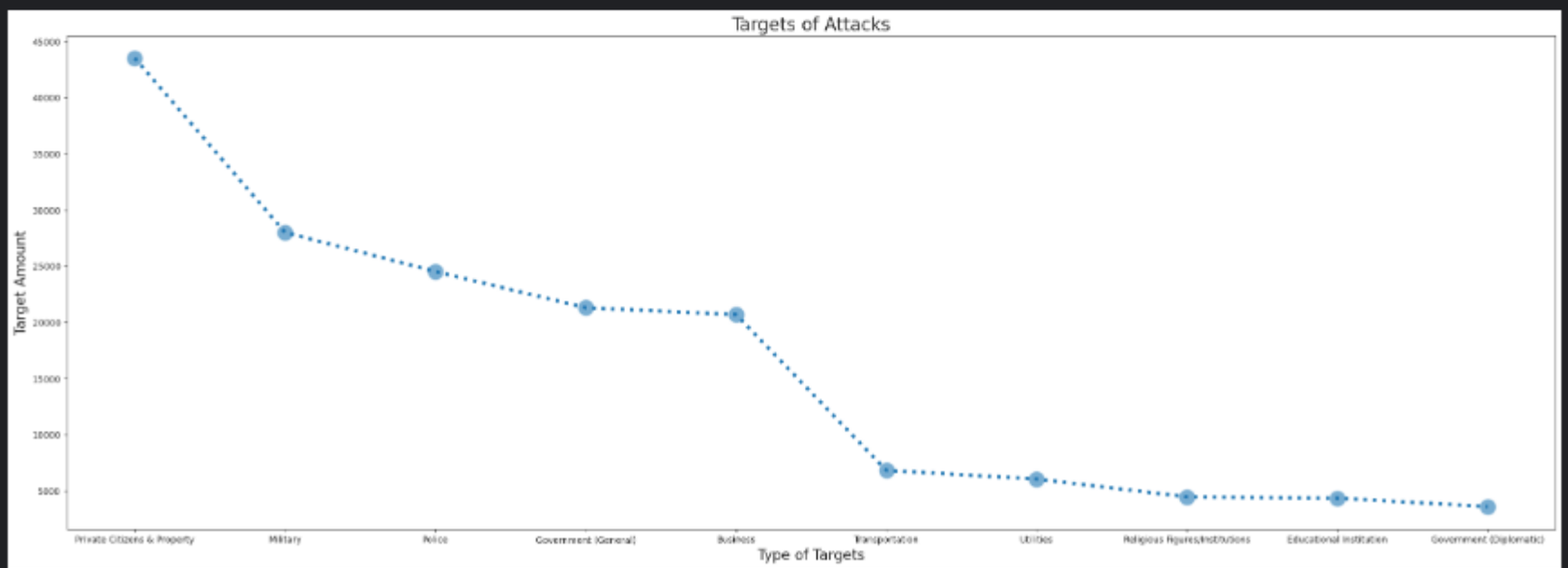
[21]:
```
targets = df['target_type'].groupby(df['target_type']).count().sort_values(ascending=False)
top_10_targets = targets.drop(['Unknown','Other']).head(10)
top_10_targets
```

[21_
```
target_type
Private Citizens & Property       43511
Military                          27984
Police                            24506
Government (General)              21283
Business                          20669
Transportation                     6799
Utilities                          6023
Religious Figures/Institutions     4440
Educational Institution            4322
Government (Diplomatic)            3573
Name: target_type, dtype: int64
```

## Graph

[22]:
```
f, ax = plt.subplots(figsize=(30, 10))
sns.lineplot(top_10_targets,linewidth = 4,linestyle='dotted')
sns.scatterplot(top_10_targets, alpha=0.6, s=350)
x = plt.xlabel('Type of Targets', fontsize=16)
y = plt.ylabel('Target Amount', fontsize=16)
plt.title('Targets of Attacks', fontsize=20)
```

[22_
```
Text(0.5, 1.0, 'Targets of Attacks')
```



## Terrorist Groups

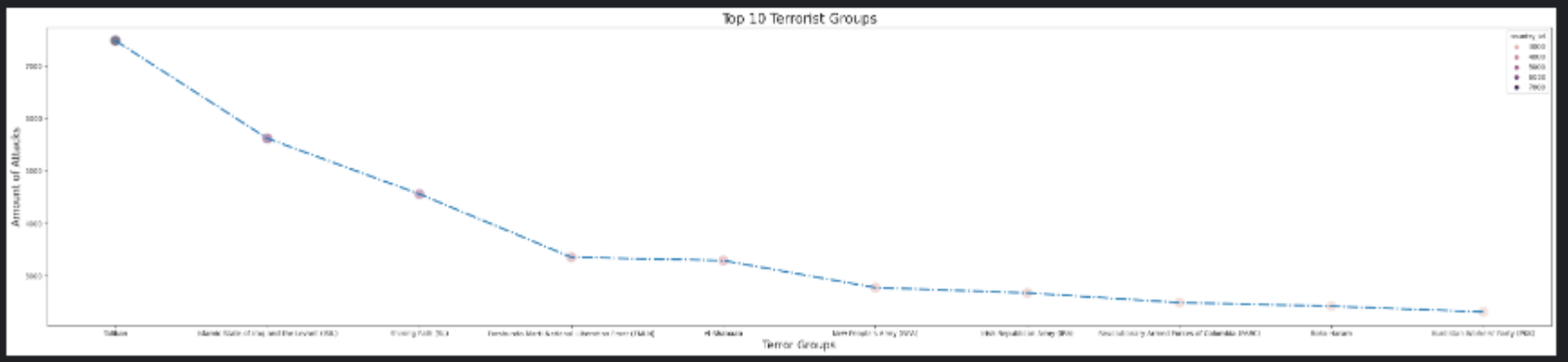
[23]:
```
groups = df[['country_id','terror_group']]
top_10_groups = groups.groupby(groups['terror_group']).count().sort_values(by='country_id',ascending=False).drop('Unknown').h
top_10_groups
```

[23_

| terror_group | country_id |
|---|---|
| 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 |
| Kurdistan Workers' Party (PKK) | 2310 |

[24]:
```
f, ax = plt.subplots(figsize=(40, 8))
sns.lineplot(top_10_groups, x='terror_group', y='country_id',linewidth=2.5, linestyle='dashdot')
sns.scatterplot(top_10_groups,x='terror_group', y='country_id',s=250, alpha=0.6, hue='country_id')
plt.ylabel("Amount of Attacks", fontsize=16)
plt.xlabel("Terror Groups", fontsize=16)
plt.title('Top 10 Terrorist Groups', fontsize=20)
```

[24_
```
Text(0.5, 1.0, 'Top 10 Terrorist Groups')
```



## Weapons used at the attacks

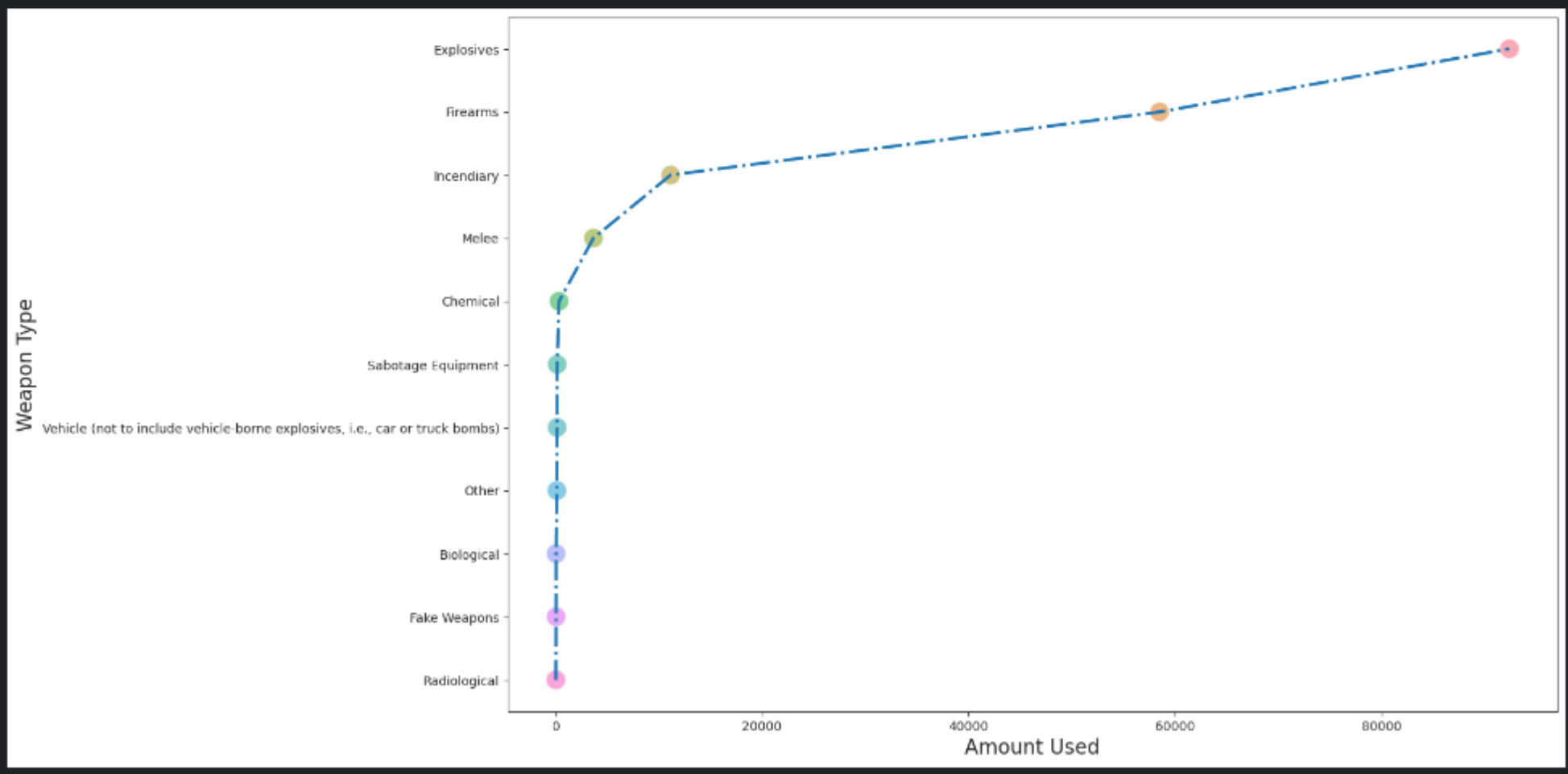
[35]:
```
a = df[['weapon_type','weapon']]

weapons = a['weapon'].groupby(a['weapon_type']).count().drop('Unknown').sort_values(ascending=False)
weapons
```

[35]:
```
weapon_type
Explosives                                                          92426
Firearms                                                            58524
Incendiary                                                          11135
Melee                                                                3655
Chemical                                                              321
Sabotage Equipment                                                    141
Vehicle (not to include vehicle-borne explosives, i.e., car or truck bombs)    136
Other                                                                 114
Biological                                                             35
Fake Weapons                                                           33
Radiological                                                           14
Name: weapon, dtype: int64
```

## Graph

[26]:
```
f, ax = plt.subplots(figsize=(15,10))
sns.lineplot(weapons,x=weapons, y='weapon_type',linewidth=2.5, linestyle='dashdot')
sns.scatterplot(weapons, x=weapons, y='weapon_type',s=250, alpha=0.6, hue='weapon_type', legend=False)
plt.xlabel('Amount Used', fontsize=16)
plt.ylabel('Weapon Type', fontsize=16)
```

[26]:
```
Text(0, 0.5, 'Weapon Type')
```



## Weapons used at the attacks

[35]:
```
a = df[['weapon_type','weapon']]

weapons = a['weapon'].groupby(a['weapon_type']).count().drop('Unknown').sort_values(ascending=False)
weapons
```

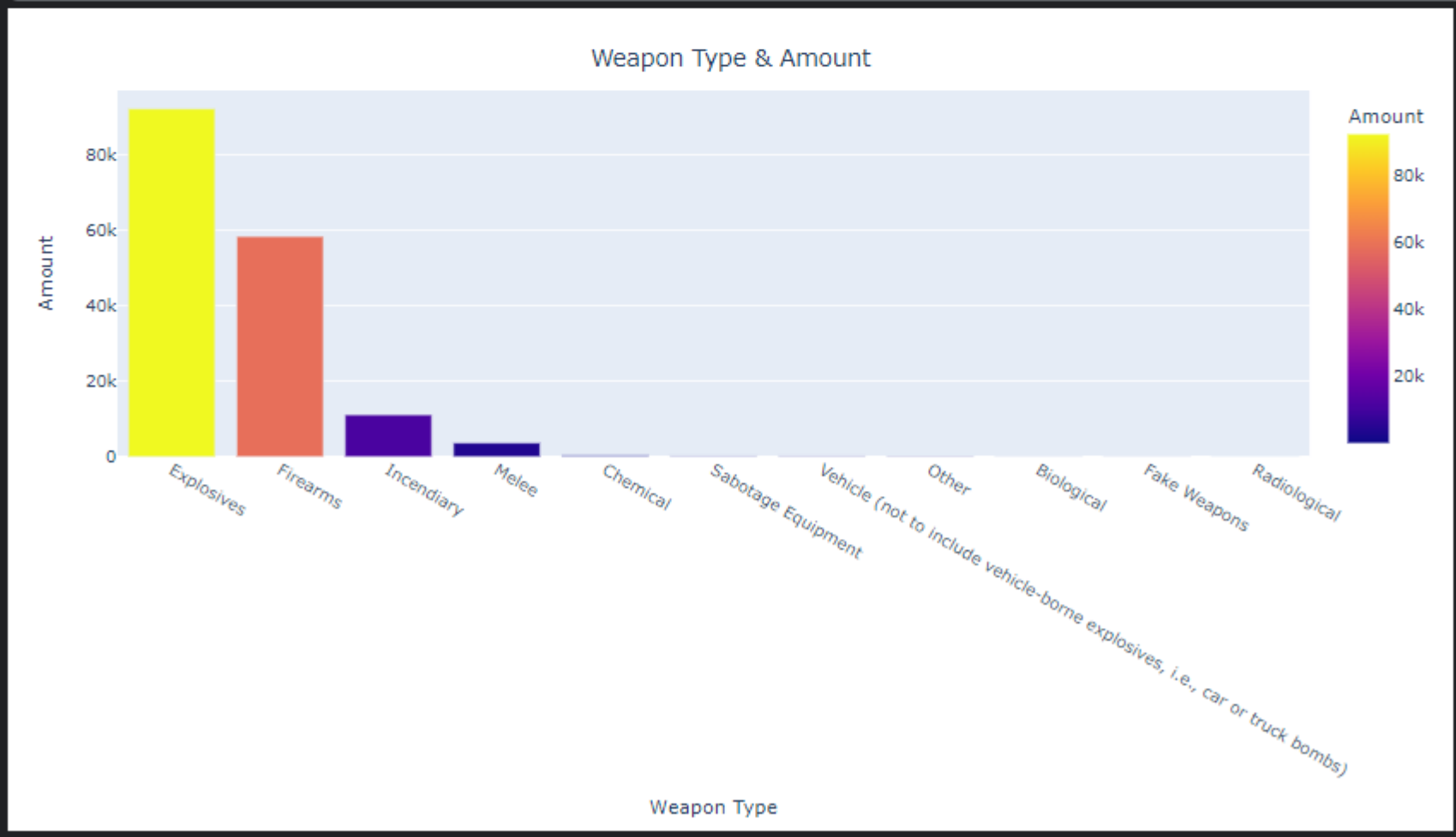
[35_
```
weapon_type
Explosives                                                    92426
Firearms                                                      58524
Incendiary                                                    11135
Melee                                                          3655
Chemical                                                        321
Sabotage Equipment                                              141
Vehicle (not to include vehicle-borne explosives, i.e., car or truck bombs)     136
Other                                                           114
Biological                                                       35
Fake Weapons                                                     33
Radiological                                                     14
Name: weapon, dtype: int64
```

## Graph

## Graph

+ Code + Markdown

[27]:
```
c = px.bar(weapons, color=weapons, height=600,
           labels={'weapon_type':'Weapon Type','value':'Amount','color':'Amount'})

c.update_layout(
    title={'text': "Weapon Type & Amount", 'y':0.95, 'x':0.5, 'xanchor': 'center', 'yanchor': 'top'})

c.show()
```



## Attack throught the years

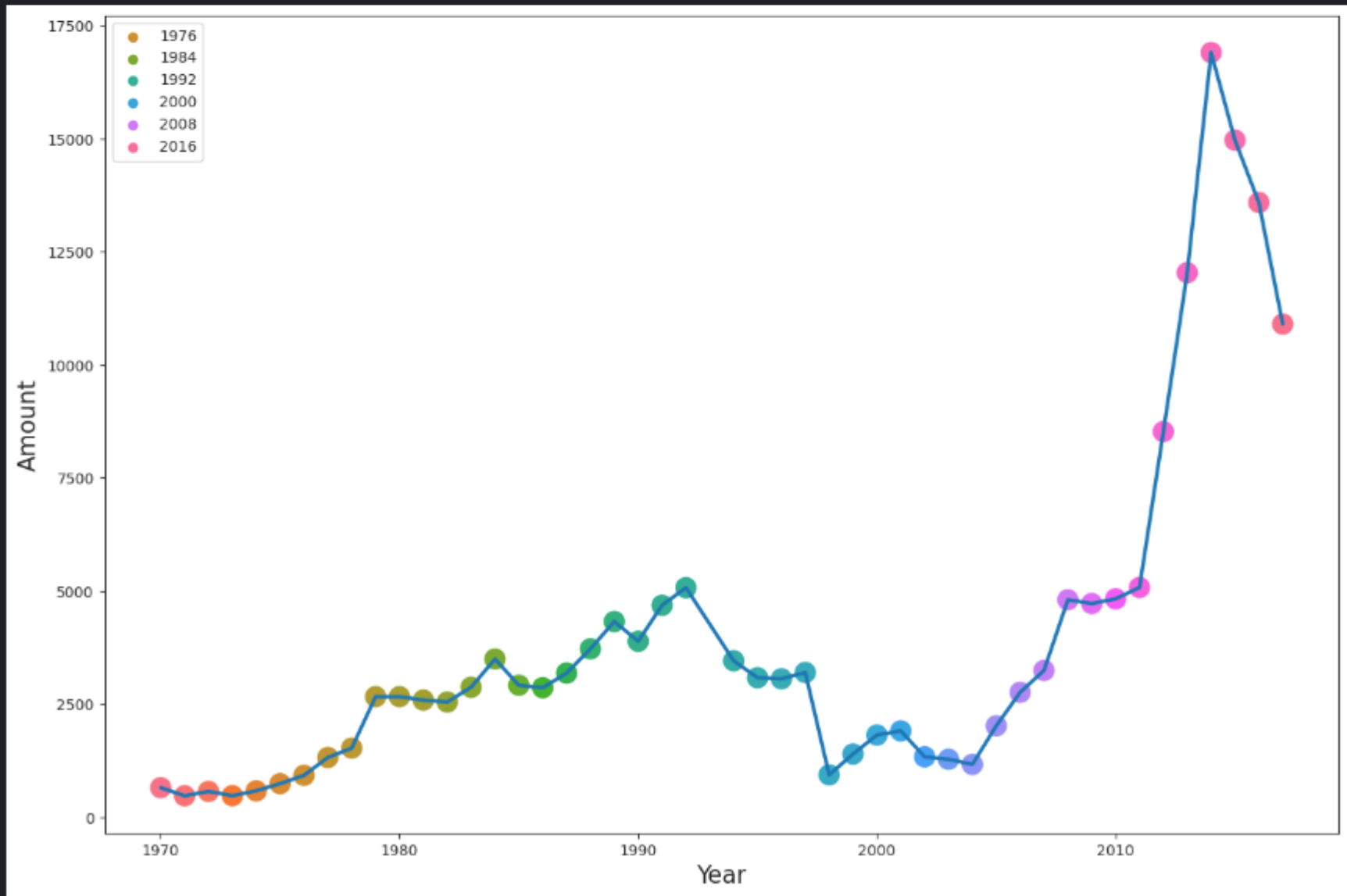
[31]:
```
yt=df[['year','attack_type']]
yt=yt[['year','attack_type']].groupby('year').count().sort_values(by='year', ascending=True)
yt.index
```

[31_
```
Int64Index([1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980,
            1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991,
            1992, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003,
            2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014,
            2015, 2016, 2017],
           dtype='int64', name='year')
```

## Graph

[60]:
```
f, ax = plt.subplots(figsize=(15,10))
sns.scatterplot(yt, y='attack_type', x='year', s=250, hue='year', palette="husl")
sns.lineplot(yt, y='attack_type', x='year', linewidth=2.5)
plt.ylabel('Amount', fontsize=16)
plt.xlabel('Year', fontsize=16)
```

[60_
```
Text(0.5, 0, 'Year')
```




+ Code + Markdown

## Attack throught the years

[31]:
```
yt=df[['year','attack_type']]
yt=yt[['year','attack_type']].groupby('year').count().sort_values(by='year', ascending=True)
yt.index
```

[31]:
```
Int64Index([1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980,
            1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991,
            1992, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003,
            2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014,
            2015, 2016, 2017],
           dtype='int64', name='year')
```

## Graph

## Graph

+ Code + Markdown

[29]:
```
d=px.bar(yt, x='attack_type', height=600,color='attack_type',
        labels={'attack_type': 'Amount', 'year': 'Year','value': 'Amount'})
d.show()
```