Jupyter notebook prepared, arranged and executed by Karthi Balasundaram , visualizing the Gun Shoots in USA from 1982 till 2022 including the Robb Elementary School Massacre, let all the good souls RIP.

Thanks to statista.com and Mother Jones.com for providing the dataset.

A special thanks to all my mentors for pushing me to explore the Earth. ¶

In [59]:
```
#importing necessary libraries
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings('ignore')
```

In [2]:
```
#reading the excel data using pandas library
data = pd.read_excel("MassShootings Database19822022.xlsx")
```

In [3]:
```
1 data.head()
```

Out[3]:

	case	location	City	State	date	summary	fatalities	injured	tota
0	Robb Elementary School massacre	Uvalde, Texas	Uvalde	Texas	2022-05-24	Salvador Ramos, 18, was identified by authorit...	21	17	
1	Buffalo supermarket massacre	Buffalo, New York	Buffalo	New York	2022-05-14	Payton S. Gendron, 18, committed a racially mo...	10	3	
2	Sacramento County church shooting	Sacramento, California	Sacramento	California	2022-02-28	"A man believed to be meeting his three childr...	4	0	
3	Oxford High School shooting	Oxford, Michigan	Oxford	Michigan	2021-11-30	Ethan Crumbley, a 15-year-old student at Oxfor...	4	7	
4	San Jose VTA shooting	San Jose, California	San Jose	California	2021-05-26	Samuel Cassidy, 57, a Valley Transportation Au...	9	0	

5 rows × 26 columns

In [4]:
```
1 data.tail()
```

Out[4]:

	case	location	City	State	date	summary	fatalities	injured	total_victi
123	Shopping centers spree killings	Palm Bay, Florida	Palm Bay	Florida	1987-04-23	Retired librarian William Cruse, 59, was paran...	6	14	
124	United States Postal Service shooting	Edmond, Oklahoma	Edmond	Oklahoma	1986-08-20	Postal worker Patrick Sherrill, 44, opened fir...	15	6	
125	San Ysidro McDonald's massacre	San Ysidro, California	San Ysidro	California	1984-07-18	James Oliver Huberty, 41, opened fire in a McD...	22	19	
126	Dallas nightclub shooting	Dallas, Texas	Dallas	Texas	1984-06-29	Abdelkrim Belachheb, 39, opened fire at an ups...	6	1	
127	Welding shop shooting	Miami, Florida	Miami	Florida	1982-08-20	Junior high school teacher Carl Robert Brown, ...	8	3	

5 rows × 26 columns

In [5]:
```
1 data
```

Out[5]:

	case	location	City	State	date	summary	fatalities	injured	t
0	Robb Elementary School massacre	Uvalde, Texas	Uvalde	Texas	2022-05-24	Salvador Ramos, 18, was identified by authorit...	21	17	
1	Buffalo supermarket massacre	Buffalo, New York	Buffalo	New York	2022-05-14	Payton S. Gendron, 18, committed a racially mo...	10	3	
2	Sacramento County	Sacramento,	Sacramento	California	2022-	"A man believed to be	4	0	

	church shooting	California			02-28	meeting his three childr...		
3	Oxford High School shooting	Oxford, Michigan	Oxford	Michigan	2021-11-30	Ethan Crumbley, a 15-year-old student at Oxfor...	4	7
4	San Jose VTA shooting	San Jose, California	San Jose	California	2021-05-26	Samuel Cassidy, 57, a Valley Transportation Au...	9	0
...	...	...	...	...	...	...	...	...
123	Shopping centers spree killings	Palm Bay, Florida	Palm Bay	Florida	1987-04-23	Retired librarian William Cruse, 59, was paran...	6	14
124	United States Postal Service shooting	Edmond, Oklahoma	Edmond	Oklahoma	1986-08-20	Postal worker Patrick Sherrill, 44, opened fir...	15	6
125	San Ysidro McDonald's massacre	San Ysidro, California	San Ysidro	California	1984-07-18	James Oliver Huberty, 41, opened fire in a McD...	22	19
126	Dallas nightclub shooting	Dallas, Texas	Dallas	Texas	1984-06-29	Abdelkrim Belachheb, 39, opened fire at an ups...	6	1
127	Welding shop shooting	Miami, Florida	Miami	Florida	1982-08-20	Junior high school teacher Carl Robert Brown, ...	8	3

128 rows × 26 columns

In [6]:
```
1 data.shape
```

Out[6]: (128, 26)

In [7]:
```
1 data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 128 entries, 0 to 127
Data columns (total 26 columns):
 #   Column                              Non-Null Count  Dtype
---  ------                              --------------  -----
 0   case                                128 non-null    object
 1   location                            128 non-null    object
 2   City                                128 non-null    object
 3   State                               128 non-null    object
 4   date                                128 non-null    datetime64[ns]
 5   summary                             128 non-null    object
 6   fatalities                          128 non-null    int64
 7   injured                             128 non-null    int64
 8   total_victims                       128 non-null    int64
 9   event_place                         128 non-null    object
 10  age_of_shooter                      128 non-null    object
 11  prior_signs_mental_health_issues    128 non-null    object
 12  mental_health_details               128 non-null    object
 13  weapons_obtained_legally            128 non-null    object
 14  where_obtained                      128 non-null    object
 15  weapon_type                         128 non-null    object
 16  weapon_details                      128 non-null    object
 17  race                                128 non-null    object
 18  gender                              128 non-null    object
 19  sources                             128 non-null    object
 20  mental_health_sources               128 non-null    object
 21  sources_additional_age              128 non-null    object
 22  latitude                            128 non-null    object
 23  longitude                           128 non-null    object
 24  type                                128 non-null    object
 25  year                                128 non-null    int64
dtypes: datetime64[ns](1), int64(4), object(21)
memory usage: 26.1+ KB
```

In [8]:
```
1 data.describe()
```

Out[8]:

	fatalities	injured	total_victims	year
count	128.000000	128.000000	128.000000	128.000000
mean	8.085938	11.554688	19.640625	2009.171875
std	7.748027	48.719801	54.111104	10.603899
min	3.000000	0.000000	3.000000	1982.000000
25%	4.000000	1.000000	6.750000	2000.750000
50%	6.000000	3.000000	10.000000	2013.000000
75%	9.000000	10.000000	17.250000	2018.000000
max	58.000000	546.000000	604.000000	2022.000000

In [9]:
```
1 data.isnull().sum()
```

Out[9]:
```
case                                0
location                            0
City                                0
State                               0
date                                0
summary                             0
fatalities                          0
injured                             0
total_victims                       0
event_place                         0
age_of_shooter                      0
prior_signs_mental_health_issues    0
mental_health_details               0
weapons_obtained_legally            0
where_obtained                      0
weapon_type                         0
weapon_details                      0
race                                0
gender                              0
sources                             0
mental_health_sources               0
sources_additional_age              0
latitude                            0
longitude                           0
type                                0
year                                0
dtype: int64
```

In [10]:
```
# grouping total victims by year
total_victims_year = data.groupby('year').sum()
print('Total Victims = ' ,total_victims_year['total_victims'].sum(
total_victims_year.sort_values(by = 'total_victims', ascending = F
```

```
Total Victims =  2514
```

Out[10]:

year	fatalities	injured	total_victims
2017	117	587	704
2019	73	112	185
2016	71	83	154
2012	71	80	151
2018	80	70	150
1999	42	47	89
2015	46	43	89
2007	53	32	85
2009	39	39	78

In [11]:
```
total_victims_year.head()
```

Out[11]:

year	fatalities	injured	total_victims
1982	8	3	11
1984	28	20	48
1986	15	6	21
1987	6	14	20
1988	7	4	11

In [12]:
```
total_victims_year.tail()
```

Out[12]:

year	fatalities	injured	total_victims
2018	80	70	150
2019	73	112	185
2020	9	0	9
2021	43	16	59
2022	35	20	55

In [13]:
```
# grouping total victims by State
total_victims_state = data.groupby('State').sum()
print('Total Victims = ' ,total_victims_state['total_victims'].sum
total_victims_state.sort_values(by = 'total_victims', ascending =
```

Virginia	44	27	71	4026
New York	40	28	68	10029
Washington	37	28	65	14064
Ohio	20	36	56	8058
Illinois	18	31	49	8046
Oregon	13	34	47	4013
Connecticut	41	5	46	6020
Pennsylvania	27	13	40	10078
Wisconsin	28	9	37	10059
Georgia	22	14	36	6032
Michigan	15	14	29	6028
Kentucky	15	13	28	3997

In [14]:
```
# grouping total victims by City
total_victims_city = data.groupby('City').sum()
print('Total Victims = ' ,total_victims_city['total_victims'].sum(
total_victims_city.sort_values(by = 'total_victims', ascending = F
```

```
Total Victims =  2514
```

Out[14]:

City	fatalities	injured	total_victims	year
Las Vegas	58	546	604	2017
Orlando	54	53	107	4033
Aurora	21	77	98	6024
Fort Hood	16	43	59	4023
Blacksburg	32	23	55	2007
...	...	...	...	...
Chicago	3	0	3	2018
Fresno	3	0	3	2017
Tunkhannock	3	0	3	2017
Kirkersville	3	0	3	2017
Yountville	3	0	3	2018

115 rows × 4 columns

In [15]:
```
# grouping total victims by common combined location
total_victims_location = data.groupby('location').sum()
print('Total Victims = ' ,total_victims_location['total_victims'].
total_victims_location.sort_values(by = 'total_victims', ascending
```

location				
Las Vegas, Nevada	58	546	604	2017
Orlando, Florida	54	53	107	4033
Aurora, Colorado	16	71	87	4005
Fort Hood, Texas	16	43	59	4023
Blacksburg, Virginia	32	23	55	2007
...	...	...	...	...
Chicago, Illinois	3	0	3	2018
Tunkhannock, Pennsylvania	3	0	3	2017
Thornton, Colorado	3	0	3	2017
Kirkersville, Ohio	3	0	3	2017
Yountville, California	3	0	3	2018

118 rows × 4 columns

In [16]:
```
total_victims_location.head()
```

Out[16]:

location	fatalities	injured	total_victims	year
Aiken, South Carolina	4	3	7	1997
Alturas, California	4	2	6	2014
Annapolis, Maryland	5	2	7	2018
Atlanta, Georgia	17	14	31	4020
Aurora, Colorado	16	71	87	4005

In [17]:
```
total_victims_location.tail()
```

Out[17]:

location	fatalities	injured	total_victims	year
Virginia Beach, Virginia	12	4	16	2019
Wakefield, Massachusetts	7	0	7	2000
Washington, D.C.	12	8	20	2013
Watkins Glen, New York	5	0	5	1992
Yountville, California	3	0	3	2018

In [18]:
```
total_victims_place = data.groupby('event_place').sum()
print('Total Victims = ' ,total_victims_place['total_victims'].sum
total_victims_place.sort_values(by = 'total_victims', ascending =
```

```
Total Victims =  2514
```

Out[18]:

event_place	fatalities	injured	total_victims	year
Public	423	942	1365	98417
Workplace	297	171	468	92449
School	197	235	432	38139
Military	41	84	125	12064
Religious	72	41	113	14088
Airport	5	6	11	2017

In [19]:
```
total_victims_year.sort_values(by = 'total_victims', ascending = F
```

2012	71	80	151
2018	80	70	150
1999	42	47	89
2015	46	43	89
2007	53	32	85
2009	39	39	78
1991	35	26	61
2021	43	16	59
1993	23	34	57
1989	15	41	56
2022	35	20	55
1998	14	36	50

In [20]:
```
total_victims_location.sort_values(by = 'total_victims', ascending
```

Out[20]:

location	fatalities	injured	total_victims	year
Las Vegas, Nevada	58	546	604	2017
Orlando, Florida	54	53	107	4033
Aurora, Colorado	16	71	87	4005
Fort Hood, Texas	16	43	59	4023
Blacksburg, Virginia	32	23	55	2007
...	...	...	...	...
Chicago, Illinois	3	0	3	2018
Tunkhannock, Pennsylvania	3	0	3	2017
Thornton, Colorado	3	0	3	2017
Kirkersville, Ohio	3	0	3	2017
Yountville, California	3	0	3	2018

118 rows × 4 columns

In [21]:
```
total_victims_place.sort_values(by = 'total_victims', ascending =
```

Out[21]:

event_place	fatalities	injured	total_victims	year
Public	423	942	1365	98417
Workplace	297	171	468	92449
School	197	235	432	38139
Military	41	84	125	12064
Religious	72	41	113	14088
Airport	5	6	11	2017

In [23]:
```
total_victims_state.sort_values(by = 'total_victims', ascending =
```

Out[23]:

State	fatalities	injured	total_victims	year
Nevada	63	553	616	4028
Texas	151	183	334	24103
California	157	160	317	46216
Florida	126	109	235	24073
Colorado	48	104	152	14072
Virginia	44	27	71	4026
New York	40	28	68	10029
Washington	37	28	65	14064
Ohio	20	36	56	8058
Illinois	18	31	49	8046
Oregon	13	34	47	4013
Connecticut	41	5	46	6020
Pennsylvania	27	13	40	10078
Wisconsin	28	9	37	10059
Georgia	22	14	36	6032
Michigan	15	14	29	6028
Kentucky	15	13	28	3997

North Carolina	12	11	23	4002
Minnesota	17	6	23	4017
Oklahoma	15	6	21	1986
D.C.	12	8	20	2013
Arizona	6	13	19	2011
Maryland	11	8	19	6053
South Carolina	13	4	17	4012
Kansas	3	14	17	2016
Arkansas	5	10	15	1998
Tennessee	9	6	15	4033
Indiana	8	7	15	2021
Mississippi	7	8	15	2003
Nebraska	9	4	13	2007
Missouri	10	2	12	4028
Utah	6	4	10	2007
Massachusetts	7	0	7	2000
New Jersey	4	3	7	2019
Iowa	6	1	7	1991
Hawaii	7	0	7	1999
Lousiana	3	3	6	2016

In [24]:
```
1 total_victims_city.sort_values(by = 'total_victims', ascending = F
```

Out[24]:

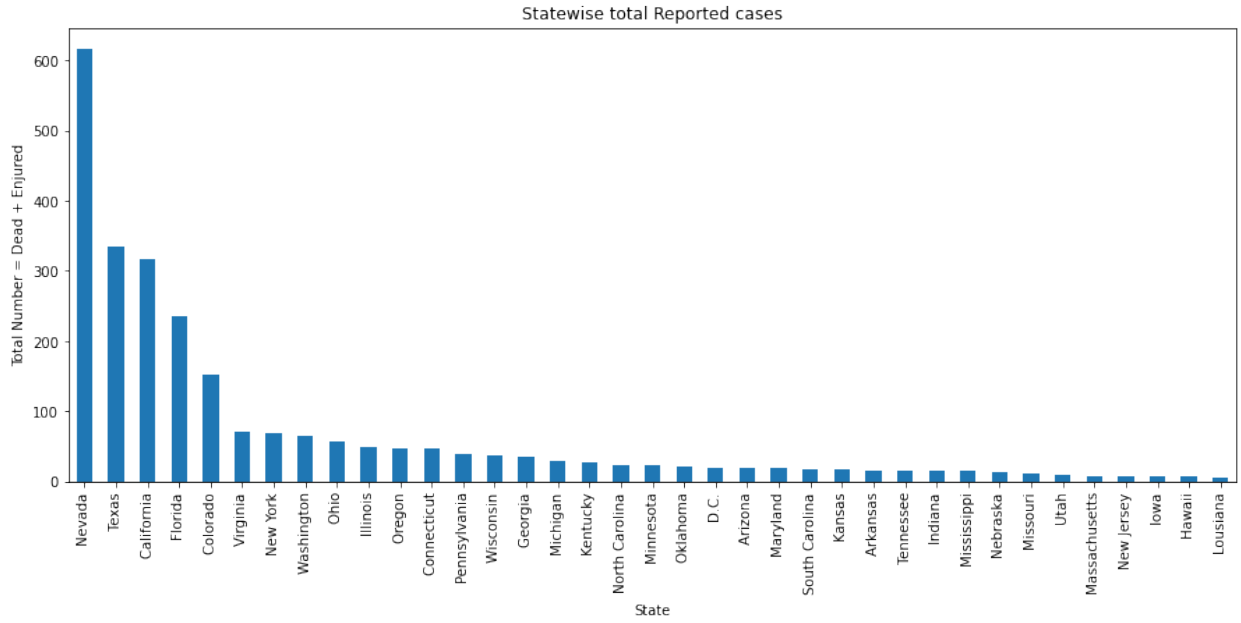
City	fatalities	injured	total_victims	year
Las Vegas	58	546	604	2017
Orlando	54	53	107	4033
Aurora	21	77	98	6024
Fort Hood	16	43	59	4023
Blacksburg	32	23	55	2007
...	...	...	...	...
Chicago	3	0	3	2018
Fresno	3	0	3	2017
Tunkhannock	3	0	3	2017
Kirkersville	3	0	3	2017
Yountville	3	0	3	2018

115 rows × 4 columns

In [25]:
```
1 data.isnull().sum()
```

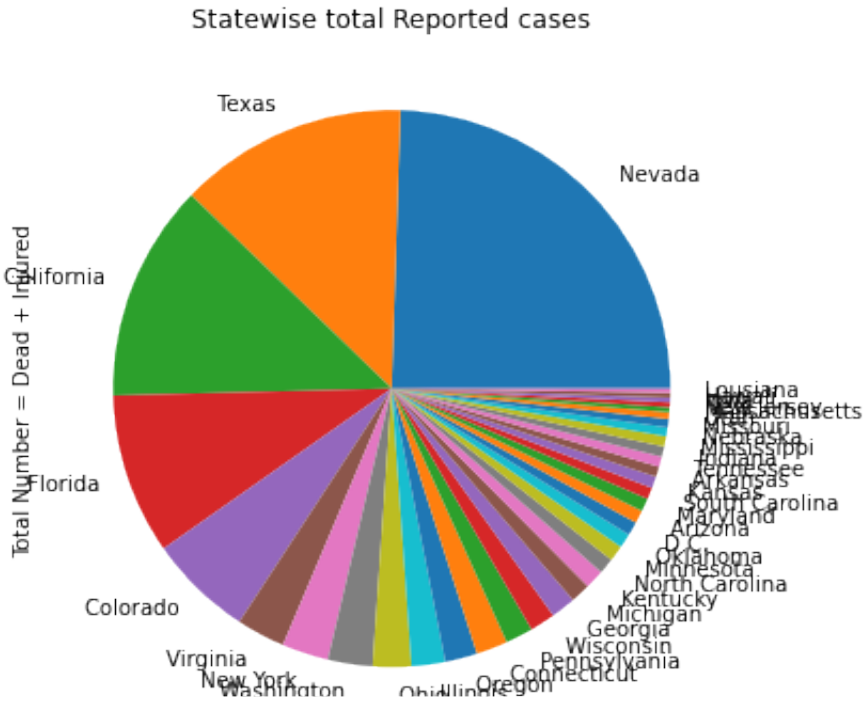
Out[25]:
```
case                                  0
location                              0
City                                  0
State                                 0
date                                  0
summary                               0
fatalities                            0
injured                               0
total_victims                         0
event_place                           0
age_of_shooter                        0
prior_signs_mental_health_issues      0
mental_health_details                 0
weapons_obtained_legally              0
where_obtained                        0
weapon_type                           0
weapon_details                        0
race                                  0
gender                                0
sources                               0
mental_health_sources                 0
sources_additional_age                0
latitude                              0
longitude                             0
type                                  0
year                                  0
dtype: int64
```

In [27]:
```
# Visualizing the total_victims with the corresponding states in a
plt.subplots(figsize = (15, 6))
cr = total_victims_state['total_victims'].sort_values(ascending =
ax = cr.plot.bar()
ax.set_xlabel('State')
ax.set_ylabel('Total Number = Dead + Injured')
ax.set_title('Statewise total Reported cases')
plt.show()
print(cr)
```

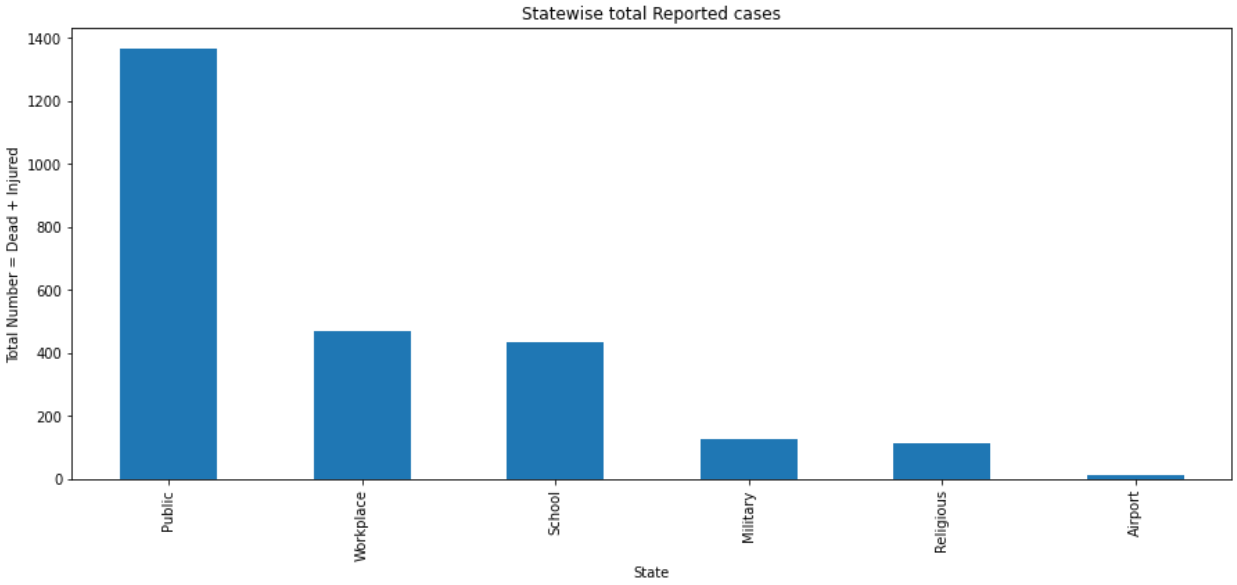


State

In [31]:
```
# Visualizing the total_victims with the corresponding states in a
plt.subplots(figsize = (15, 6))
cr = total_victims_state['total_victims'].sort_values(ascending =
ax = cr.plot.pie()
ax.set_xlabel('State')
ax.set_ylabel('Total Number = Dead + Injured')
ax.set_title('Statewise total Reported cases')
plt.show()
print(cr)
```

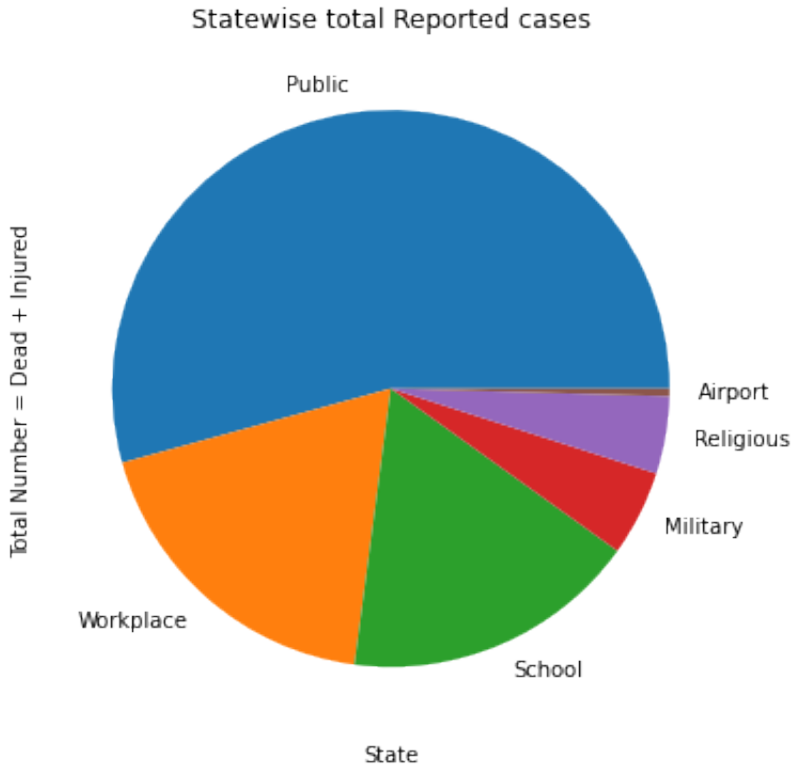


In [30]:
```
# Visualizing the total_victims with the corresponding place in a
plt.subplots(figsize = (15, 6))
cr1 = total_victims_place['total_victims'].sort_values(ascending =
ax = cr1.plot.bar()
ax.set_xlabel('State')
ax.set_ylabel('Total Number = Dead + Injured')
ax.set_title('Statewise total Reported cases')
plt.show()
print(cr1)
```




```
event_place
Public       1365
Workplace     468
School        432
Military      125
Religious     113
Airport        11
Name: total_victims, dtype: int64
```

In [32]:
```
# Visualizing the total_victims with the corresponding place in a
plt.subplots(figsize = (15, 6))
cr1 = total_victims_place['total_victims'].sort_values(ascending =
ax = cr1.plot.pie()
ax.set_xlabel('State')
ax.set_ylabel('Total Number = Dead + Injured')
ax.set_title('Statewise total Reported cases')
plt.show()
print(cr1)
```




```
event_place
Public       1365
Workplace     468
School        432
Military      125
Religious     113
Airport        11
Name: total_victims, dtype: int64
```

In [33]:
```
# displaying the total school victims
school_victims = data[data['event_place'] == 'School']
```

In [34]:
```
1 school_victims
```

	shooting					an AR-...		
53	Umpqua Community College shooting	Roseburg, Oregon	Roseburg	Oregon	2015-10-01	26-year-old Chris Harper Mercer opened fire at...	9	9
57	Marysville-Pilchuck High School shooting	Marysville, Washington	Marysville	Washington	2014-10-24	Jaylen Fryberg, 15, using a .40-caliber Berret...	5	1
58	Isla Vista mass murder	Santa Barbara, California	Santa Barbara	California	2014-05-23	Elliot Rodger, 22, shot three people to death ...	6	13
66	Sandy Hook Elementary massacre	Newtown, Connecticut	Newtown	Connecticut	2012-12-14	Adam Lanza, 20, shot his mother dead at their ...	27	2

In [36]:
```
1 school_victims.head()
```

Out[36]:

	case	location	City	State	date	summary	fatalities	injured	total_victim
0	Robb Elementary School massacre	Uvalde, Texas	Uvalde	Texas	2022-05-24	Salvador Ramos, 18, was identified by authorit...	21	17	3
3	Oxford High School shooting	Oxford, Michigan	Oxford	Michigan	2021-11-30	Ethan Crumbley, a 15-year-old student at Oxfor...	4	7	1
28	Santa Fe High School shooting	Santa Fe, Texas	Santa Fe	Texas	2018-05-18	Dimitrios Pagourtzis, a 17-year-old student, o...	10	13	2
31	Marjory Stoneman Douglas High School shooting	Parkland, Florida	Parkland	Florida	2018-02-14	Nikolas J. Cruz, 19, heavily armed with an AR-...	17	17	3
53	Umpqua Community College shooting	Roseburg, Oregon	Roseburg	Oregon	2015-10-01	26-year-old Chris Harper Mercer opened fire at...	9	9	1

5 rows × 26 columns

In [37]:
```
1 school_victims.tail()
```

Out[37]:

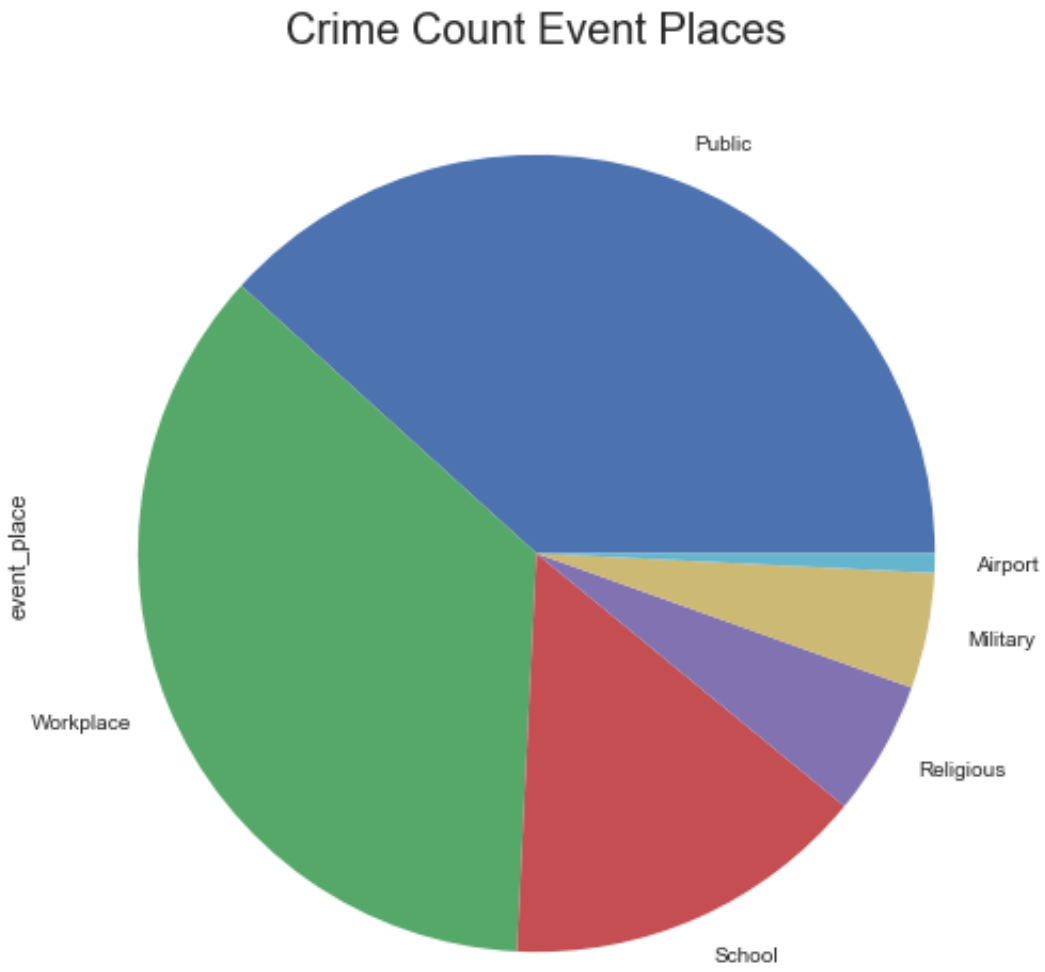
	case	location	City	State	date	summary	fatalities	injured	total_vict
102	Thurston High School shooting	Springfield, Oregon	Springfield	Oregon	1998-05-21	After he was expelled for having a gun in his ...	4	25	
103	Westside Middle School killings	Jonesboro, Arkansas	Jonesboro	Arkansas	1998-03-24	Mitchell Scott Johnson, 13, and Andrew Douglas...	5	10	
115	Lindhurst High School shooting	Olivehurst, California	Olivehurst	California	1992-05-01	Former Lindhurst High School student Eric Hous...	4	10	
117	University of Iowa shooting	Iowa City, Iowa	Iowa City	Iowa	1991-11-01	Former graduate student Gang Lu, 28, went on a...	6	1	
121	Stockton schoolyard shooting	Stockton, California	Stockton	California	1989-01-17	Patrick Purdy, 26, an alcoholic with a police ...	6	29	

5 rows × 26 columns

In [39]:

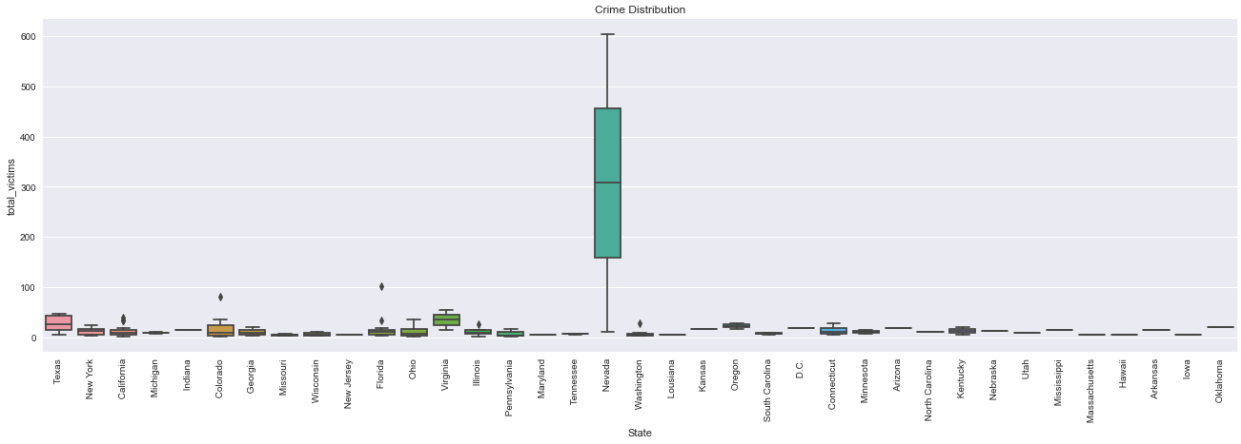
```
import squarify
y = data['total_victims'].value_counts().head(25)
plt.rcParams['figure.figsize'] = (15, 15)
plt.style.use('fivethirtyeight')
color = plt.cm.magma(np.linspace(0, 1, 15))
squarify.plot(sizes = y.values, label = y.index, alpha=.8, color =
plt.title('Tree Map for Top Crime', fontsize = 35)
plt.axis('off')
plt.show()
```

In [46]:
```
plt.style.use('seaborn')
data['event_place'].value_counts().head(11).plot.pie(figsize = (15
plt.title('Crime Count Event Places',fontsize = 20)
plt.xticks(rotation = 90)
plt.show()
```



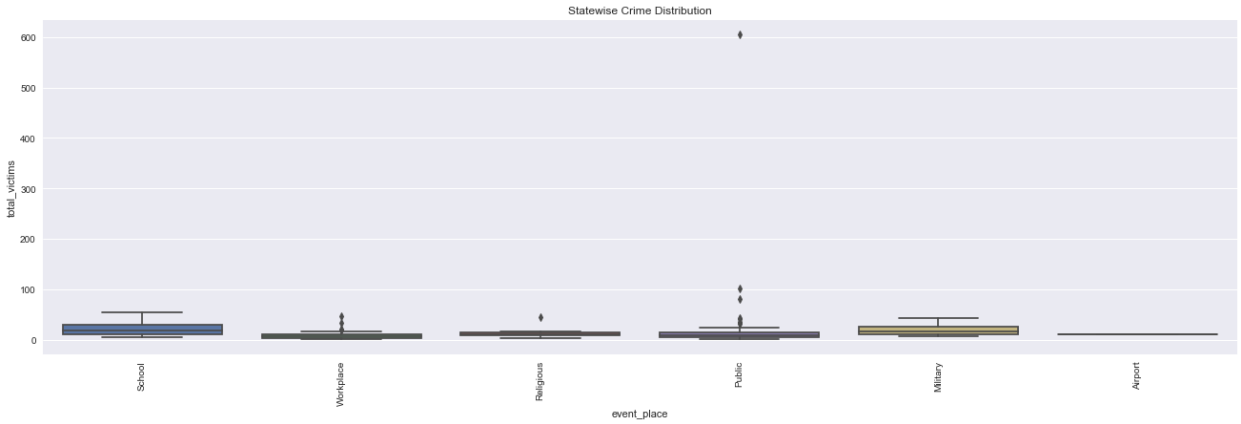
In [48]:
```
plt.figure(figsize=(20,6))
ax = sns.boxplot(x='State',y='total_victims',data=data)
plt.xticks(rotation=90)
ax.set_title("Statewise Crime Distribution")
```

Out[48]: Text(0.5, 1.0, 'Crime Distribution')



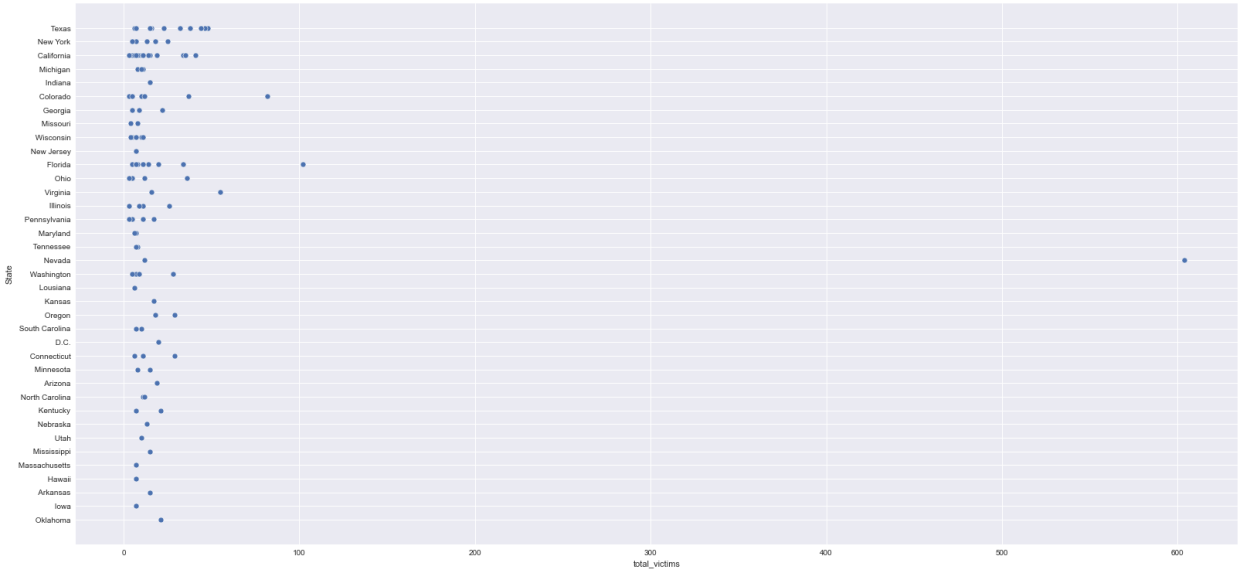
In [49]:
```
plt.figure(figsize=(20,6))
ax = sns.boxplot(x='event_place',y='total_victims',data=data)
plt.xticks(rotation=90)
ax.set_title("Statewise Crime Distribution")
```

Out[49]: Text(0.5, 1.0, 'Statewise Crime Distribution')



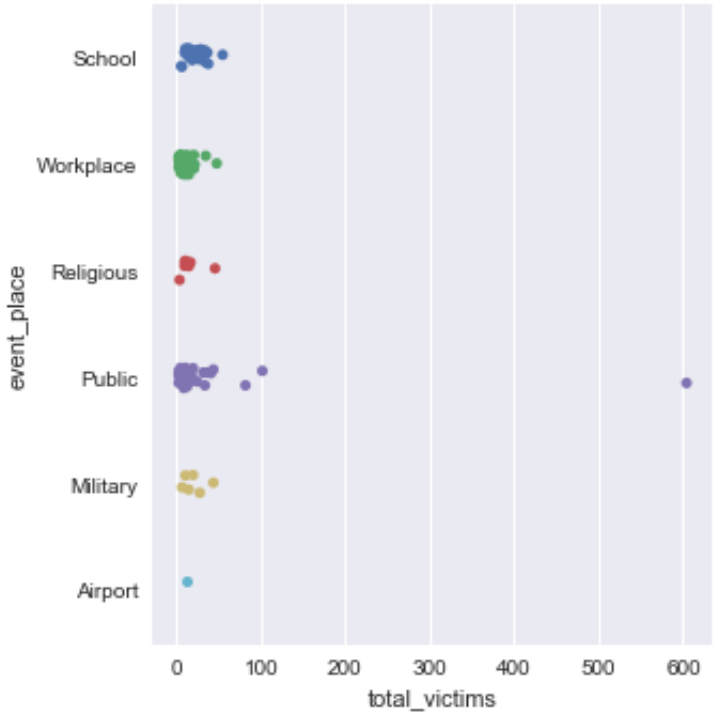
In [50]:
```
plt.figure(figsize=(24,12))
sns.scatterplot(x="total_victims",y="State",data=data)
```

Out[50]: <AxesSubplot:xlabel='total_victims', ylabel='State'>



In [57]:
```
sns.catplot(x="total_victims",y="event_place",data=data)
```

Out[57]: <seaborn.axisgrid.FacetGrid at 0x7fd4cbc12d60>



Thank you for your time.

Dataset may be available at above mentioned websites.

In [ ]:
```
1
```