In [123]:
```python
import pandas as pd
accidents_df = pd.read_csv("accidents.csv")
accidents_df.columns
```

Out[123]: Index(['Id', 'District Name', 'Neighborhood Name', 'Street', 'Weekday',
       'Month', 'Day', 'Hour', 'Part of the day', 'Mild injuries',
       'Serious injuries', 'Victims', 'Vehicles involved', 'Longitude',
       'Latitude'],
      dtype='object')

In [124]:
```python
accidents_df.columns = ["id", "district_name", "neighbourhood_name", "street", "w
                "part_day", "mild_injuries", "serious_injuries", "victims", "vehicl
```

In [125]:
```python
accidents_df
```

Out[125]:

	id	district_name	neighbourhood_name	street	weekday	month	day
0	2017S008429	Unknown	Unknown	Número 27 ...	Friday	October	1:
1	2017S007316	Unknown	Unknown	Número 3 Zona Franca / Número 50 Zona Franca ...	Friday	September	
2	2017S010210	Unknown	Unknown	Litoral (Besòs) ...	Friday	December	:
3	2017S006364	Unknown	Unknown	Número 3 Zona Franca ...	Friday	July	2
4	2017S004615	Sant Martí	el Camp de l'Arpa del Clot	Las Navas de Tolosa ...	Thursday	May	2!
...	...	...	...	...	...	...	..
10334	2017S003667	Sant Andreu	el Bon Pastor	Litoral (Llobregat) ...	Tuesday	April	2!
10335	2017S001896	Sant Andreu	el Bon Pastor	PL MONTERREY ...	Wednesday	March	:
10336	2017S010718	Sant Andreu	el Bon Pastor	Litoral (Llobregat) ...	Thursday	December	2:
10337	2017S006145	Sant Andreu	el Bon Pastor	Litoral (Besòs) ...	Friday	July	1-
10338	2017S000178	Sant Andreu	el Bon Pastor	CIUTAT D'ASUNCIÓN ...	Sunday	January	:

10339 rows × 15 columns

In [126]:
```python
districts = accidents_df["district_name"].value_counts(normalize=False, dropna=Fa
districts
```

Out[126]:
```
Eixample                3029
Sant Martí              1336
Sants-Montjuïc          1104
Sarrià-Sant Gervasi     1104
Horta-Guinardó           743
Les Corts                726
Ciutat Vella             600
Sant Andreu              597
Nou Barris               542
Gràcia                   531
Name: district_name, dtype: int64
```

In [77]:
```python
neighbourhood = accidents_df["neighbourhood_name"].value_counts(normalize=False,
neighbour = neighbourhood.index
neighbour
```

Out[77]:
```
Index(['la Dreta de l'Eixample', 'l'Antiga Esquerra de l'Eixample',
       'la Nova Esquerra de l'Eixample', 'Sant Gervasi - Galvany',
       'la Sagrada Família', 'les Corts', 'el Fort Pienc',
       'la Marina del Prat Vermell', 'el Poble-sec', 'Sant Antoni'],
      dtype='object')
```

In [56]:
```python
street = accidents_df["street"].value_counts(normalize=False, dropna=False).sort_
street
```

Out[56]:
```
Corts Catalanes                    219
Diagonal                           176
Litoral (Llobregat)                116
Litoral (Besòs)                     99
Aragó                               95
Meridiana                           92
Dalt (Llobregat)                    89
Dalt (Besòs)                        88
AV DIAGONAL                         64
GV CORTS CATALANES                  61
Name: street, dtype: int64
```

In [66]:
```python
weekday = accidents_df["weekday"].value_counts(normalize=False, dropna=False).sor
weekday
```

Out[66]:
```
Friday       1761
Tuesday      1691
Thursday     1677
Wednesday    1650
Monday       1510
Saturday     1155
Sunday        895
Name: weekday, dtype: int64
```

```
In [58]: victims = accidents_df["victims"].value_counts(normalize=False, dropna=False).sor
         victims
```

```
Out[58]: 1     7385
         2     1611
         0      902
         3      284
         4      102
         5       32
         6       11
         7        8
         10       2
         8        1
         Name: victims, dtype: int64
```

```
In [70]: accidents_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10339 entries, 0 to 10338
Data columns (total 15 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   id                  10339 non-null  object
 1   district_name       10339 non-null  object
 2   neighbourhood_name  10339 non-null  object
 3   street              10339 non-null  object
 4   weekday             10339 non-null  object
 5   month               10339 non-null  object
 6   day                 10339 non-null  int64
 7   hour                10339 non-null  int64
 8   part_day            10339 non-null  object
 9   mild_injuries       10339 non-null  int64
 10  serious_injuries    10339 non-null  int64
 11  victims             10339 non-null  int64
 12  vehicles_involved   10339 non-null  int64
 13  longitude           10339 non-null  float64
 14  latitude            10339 non-null  float64
dtypes: float64(2), int64(6), object(7)
memory usage: 1.2+ MB
```

```
In [68]: weekdays = weekday.index
         weekdays
```

```
Out[68]: Index(['Friday', 'Tuesday', 'Thursday', 'Wednesday', 'Monday', 'Saturday',
                'Sunday'],
               dtype='object')
```

In [74]:
```python
weekdays_victim = {}
for checks in weekdays:
    week = accidents_df["weekday"]
    week_bool = week == checks
    vic = accidents_df.loc[week_bool, "victims"]
    weekdays_victim[checks] = vic.sum()
weekdays_victim
```

Out[74]:
```
{'Friday': 2031,
 'Tuesday': 1982,
 'Thursday': 1981,
 'Wednesday': 1903,
 'Monday': 1755,
 'Saturday': 1448,
 'Sunday': 1086}
```

In [79]:
```python
neighbour_victim = {}
for checks in neighbour:
    week = accidents_df["neighbourhood_name"]
    week_bool = week == checks
    vic = accidents_df.loc[week_bool, "victims"]
    neighbour_victim[checks] = vic.sum()
neighbour_victim
```

Out[79]:
```
{"la Dreta de l'Eixample": 1368,
 "l'Antiga Esquerra de l'Eixample": 680,
 "la Nova Esquerra de l'Eixample": 454,
 'Sant Gervasi - Galvany': 446,
 'la Sagrada Família': 457,
 'les Corts': 385,
 'el Fort Pienc': 319,
 'la Marina del Prat Vermell': 304,
 'el Poble-sec': 291,
 'Sant Antoni': 284}
```

In [82]:
```python
a = pd.Series(neighbour_victim)
sum_victims = pd.DataFrame(a, columns=["Total Victims"])
sum_victims
```

Out[82]:

	Total Victims
la Dreta de l'Eixample	1368
l'Antiga Esquerra de l'Eixample	680
la Nova Esquerra de l'Eixample	454
Sant Gervasi - Galvany	446
la Sagrada Família	457
les Corts	385
el Fort Pienc	319
la Marina del Prat Vermell	304
el Poble-sec	291
Sant Antoni	284

In [85]:
```python
vehicles = accidents_df["vehicles_involved"].value_counts(normalize=False, dropna
vehicles.index
```

Out[85]:
```
Int64Index([2, 1, 3, 4, 5, 6, 7, 9, 0, 8], dtype='int64')
```

In [ ]:
```python
vehicle_neighbour = {}
for checks in neighbour:
    week = accidents_df["neighbourhood_name"]
    week_bool = week == checks
    vic = accidents_df.loc[week_bool, "victims"]
    neighbour_victim[checks] = vic.sum()
neighbour_victim
```

In [89]:
```python
hours = accidents_df["hour"].between(8, 13)
accidents_df[hours]
```

Out[89]:

	id	district_name	neighbourhood_name	street	weekday	month	day
0	2017S008429	Unknown	Unknown	Número 27 ...	Friday	October	13
1	2017S007316	Unknown	Unknown	Número 3 Zona Franca / Número 50 Zona Franca ...	Friday	September	
5	2017S007775	Sant Martí	el Camp de l'Arpa del Clot	Indústria / Trinxant ...	Wednesday	September	2(
12	2017S005695	Sant Martí	el Camp de l'Arpa del Clot	Sant Antoni Maria Claret / Guinardó ...	Friday	June	3(
24	2017S001012	Sant Martí	el Camp de l'Arpa del Clot	MALLORCA ...	Tuesday	February	
...	...	...	...	...	...	...	..
10331	2017S006331	Sant Andreu	el Bon Pastor	Litoral (Besòs) ...	Thursday	July	2(
10332	2017S004154	Sant Andreu	el Bon Pastor	Litoral (Besòs) ...	Wednesday	May	1(
10334	2017S003667	Sant Andreu	el Bon Pastor	Litoral (Llobregat) ...	Tuesday	April	2!
10335	2017S001896	Sant Andreu	el Bon Pastor	PL MONTERREY ...	Wednesday	March	{
10336	2017S010718	Sant Andreu	el Bon Pastor	Litoral (Llobregat) ...	Thursday	December	2{

3595 rows × 15 columns

```
In [90]: import pandas as pd
         accidents_df = pd.read_csv("accidents.csv")
         accidents_df.columns
```

```
Out[90]: Index(['Id', 'District Name', 'Neighborhood Name', 'Street', 'Weekday',
                'Month', 'Day', 'Hour', 'Part of the day', 'Mild injuries',
                'Serious injuries', 'Victims', 'Vehicles involved', 'Longitude',
                'Latitude'],
              dtype='object')
```

```
In [92]: from csv import reader
         the_file = open("accidents.csv", encoding="UTF-8")
         read_file = reader(the_file)
         accident_list = list(read_file)
         accident_list_header = accident_list[0]
         accident_list = accident_list[1:]
```

```
In [93]: accident_list_header
```

```
Out[93]: ['Id',
          'District Name',
          'Neighborhood Name',
          'Street',
          'Weekday',
          'Month',
          'Day',
          'Hour',
          'Part of the day',
          'Mild injuries',
          'Serious injuries',
          'Victims',
          'Vehicles involved',
          'Longitude',
          'Latitude']
```

```
In [147]: accident_list
```

```
Out[147]: [['2017S008429    ',
            'Unknown',
            'Unknown',
            'Número 27                                          ',
            'Friday',
            'October',
            '13',
            '8',
            'Morning',
            '2',
            '0',
            '2',
            '2',
            '2.12562442',
            '41.34004482'],
           ['2017S007316    ',
            'Unknown',
            'Unknown',
            'Número 3 Zona Franca / Número 50 Zona Franca       ',
```

```
In [146]: accident_list[56][11]
```

```
Out[146]: '1'
```

```
In [ ]:
```

```
In [119]: district_dict = {}
          for checks in accident_list:
              district = checks[1]
              if district in district_dict:
                  district_dict[district] += 1
              else:
                  district_dict[district] = 1
          district_dict
```

```
Out[119]: {'Unknown': 27,
           'Sant Martí': 1336,
           'Ciutat Vella': 600,
           'Eixample': 3029,
           'Sants-Montjuïc': 1104,
           'Les Corts': 726,
           'Sarrià-Sant Gervasi': 1104,
           'Gràcia': 531,
           'Horta-Guinardó': 743,
           'Nou Barris': 542,
           'Sant Andreu': 597}
```

In [157]:
```python
victim_dictionary = {}
for checks in accident_list:
    neighbour = checks[2]
    vict = checks[11]
    if neighbour in victim_dictionary:
        victim_dictionary[neighbour] += int(vict)
    else:
        victim_dictionary[neighbour] = int(vict)
victim_dictionary
```

Out[157]: {'Unknown': 40,
 "el Camp de l'Arpa del Clot": 208,
 'el Clot': 174,
 'Sant Martí de Provençals': 95,
 'la Verneda i la Pau': 94,
 'el Besòs i el Maresme': 107,
 'Provençals del Poblenou': 250,
 'el Poblenou': 173,
 'Diagonal Mar i el Front Marítim del Poblenou': 192,
 'el Parc i la Llacuna del Poblenou': 223,
 'el Raval': 147,
 'la Vila Olímpica del Poblenou': 129,
 'el Barri Gòtic': 188,
 'Sant Pere, Santa Caterina i la Ribera': 147,
 'la Barceloneta': 152,
 'Sant Antoni': 284,
 "la Nova Esquerra de l'Eixample": 454,
 'la Sagrada Família': 457,
 "la Dreta de l'Eixample": 1368,
 "l'Antiga Esquerra de l'Eixample": 680,
 'el Fort Pienc': 319,
 'el Poble-sec': 291,
 'la Marina del Prat Vermell': 304,
 'la Marina de Port': 113,
 'la Bordeta': 120,
 'Hostafrancs': 153,
 'la Font de la Guatlla': 56,
 'Sants': 211,
 'Sants - Badal': 81,
 'les Corts': 385,
 'la Maternitat i Sant Ramon': 237,
 'Pedralbes': 272,
 'Sant Gervasi - Galvany': 446,
 'Sarrià': 215,
 'Sant Gervasi - la Bonanova': 261,
 'les Tres Torres': 185,
 'el Putxet i el Farró': 152,
 'Vallvidrera, el Tibidabo i les Planes': 31,
 'Vallcarca i els Penitents': 171,
 'el Coll': 24,
 'la Vila de Gràcia': 180,
 'la Salut': 65,
 "el Camp d'en Grassot i Gràcia Nova": 148,
 'Sant Genís dels Agudells': 78,
 'Montbau': 52,
 'la Teixonera': 43,
 "la Font d'en Fargues": 48,

```
            'la Clota': 23,
            "la Vall d'Hebron": 76,
            'Horta': 179,
            'Can Baró': 15,
            'el Carmel': 87,
            'el Baix Guinardó': 131,
            'el Guinardó': 107,
            'Torre Baró': 7,
            'les Roquetes': 51,
            'Canyelles': 47,
            'Vallbona': 8,
            'Ciutat Meridiana': 2,
            'Verdun': 25,
            'la Guineueta': 63,
            'la Trinitat Nova': 111,
            'la Prosperitat': 90,
            'Vilapicina i la Torre Llobeta': 100,
            'Porta': 112,
            'el Turó de la Peira': 34,
            'Can Peguera': 11,
            'la Sagrera': 73,
            'el Congrés i els Indians': 40,
            'Sant Andreu': 230,
            'Navas': 67,
            'la Trinitat Vella': 87,
            'Baró de Viver': 54,
            'el Bon Pastor': 153}
```

In [151]: `accident_list`

Out[151]:
```
[['2017S008429     ',
  'Unknown',
  'Unknown',
  'Número 27                                              ',
  'Friday',
  'October',
  '13',
  '8',
  'Morning',
  '2',
  '0',
  '2',
  '2',
  '2.12562442',
  '41.34004482'],
 ['2017S007316     ',
  'Unknown',
  'Unknown',
  'Número 3 Zona Franca / Número 50 Zona Franca       ',
```

In [158]:
```python
import numpy as np
accident_array = np.array([accident_list])
```

In [159]:

Out[159]: array([[['2017S008429   ', 'Unknown', 'Unknown', ..., '2',
                    '2.12562442', '41.34004482'],
                   ['2017S007316   ', 'Unknown', 'Unknown', ..., '2',
                    '2.12045245', '41.33942606'],
                   ['2017S010210   ', 'Unknown', 'Unknown', ..., '2', '2.1673561',
                    '41.3608855'],
                   ...,
                   ['2017S010718   ', 'Sant Andreu', 'el Bon Pastor', ..., '2',
                    '2.205607', '41.443894'],
                   ['2017S006145   ', 'Sant Andreu', 'el Bon Pastor', ..., '2',
                    '2.205118', '41.444824'],
                   ['2017S000178   ', 'Sant Andreu', 'el Bon Pastor', ..., '1',
                    '2.200956', '41.437125']]], dtype='<U50')

In [ ]: