Opening a Food truck in San Diego

Introduction:

San Diego is a city in the U.S. state of California on the coast of the Pacific Ocean, approximately 120 miles (190 km) south of Los Angeles and immediately adjacent to the border with Mexico. San Diego is the eighth-largest city in the United States and second largest in California. San Diego was originally centered on the Old Town district, but by the late 1860s the focus had shifted to the bayfront, in the belief that this new location would increase trade. As the "New Town" – present-day Downtown – waterfront location quickly developed, it eclipsed Old Town as the center of San Diego.

Downtown San Diego has a busy nightlife with many bars, restaurants and other eateries. However, one of the drawbacks of the downtown area is the lack of affordable food options. Most restaurants in downtown area close early and very few are open close to the late night.

Opening a food truck:

A young San Diegan wanted to open a food truck near the busy nightlife area to cater to the night owls. But before he opens his food truck, he wanted to thoroughly study the neighborhood of Downtown and understand the best area to open his business. Since he is planning to open his food truck in the late hours, we are also interested to see the crime rate in the neighborhood.

Using our data analysis skills, we will help him find the most suitable place for his food truck.

Data source:

Crime data for San Diego (2019) was obtained from this source:
https://www.sandiego.gov/police/services/statistics

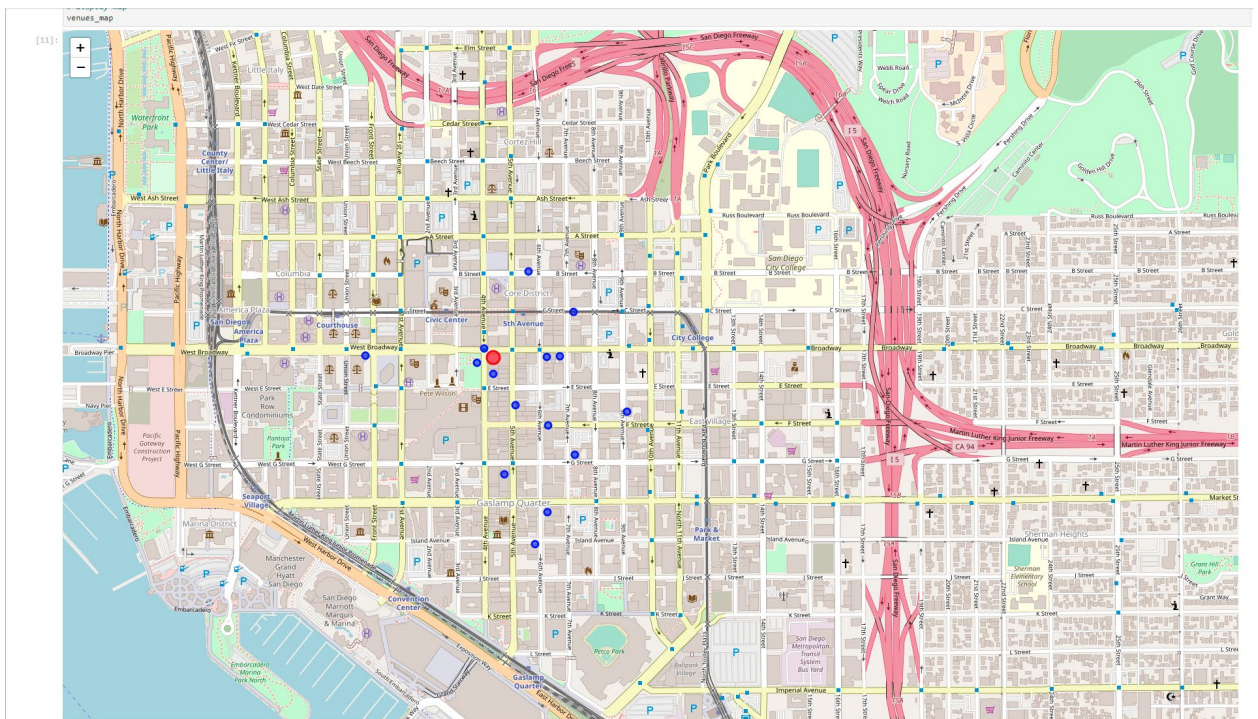The data was cleaned up and will be used in my analysis.

I will also be using Foursquare API for getting venues closer to downtown San Diego.

Data Analysis:

a. **Getting nightlife data from Foursquare API**

```
[10]: dataframe_filtered.name
```

```
[10]: 0                   Fright Night Party
      1                   Night And Day Vip
      2                   Night Time Events
      3                   Boudoir Night Club
      4                   Omnia Nightclub
      5                   98 Bottles/noli Nights
      6                   Parq Restaurant & Nightclub
      7                   Ad Nightclub
      8                   Lair Nightclub
      9       Nighthawk Private Investigations
      10                  sandiego2night
      11                  Vanish Nightclub
      12                  California Nightlife
      13      Downtown Nightlife Association
      14                  Budoir Nightclub
      Name: name, dtype: object
```
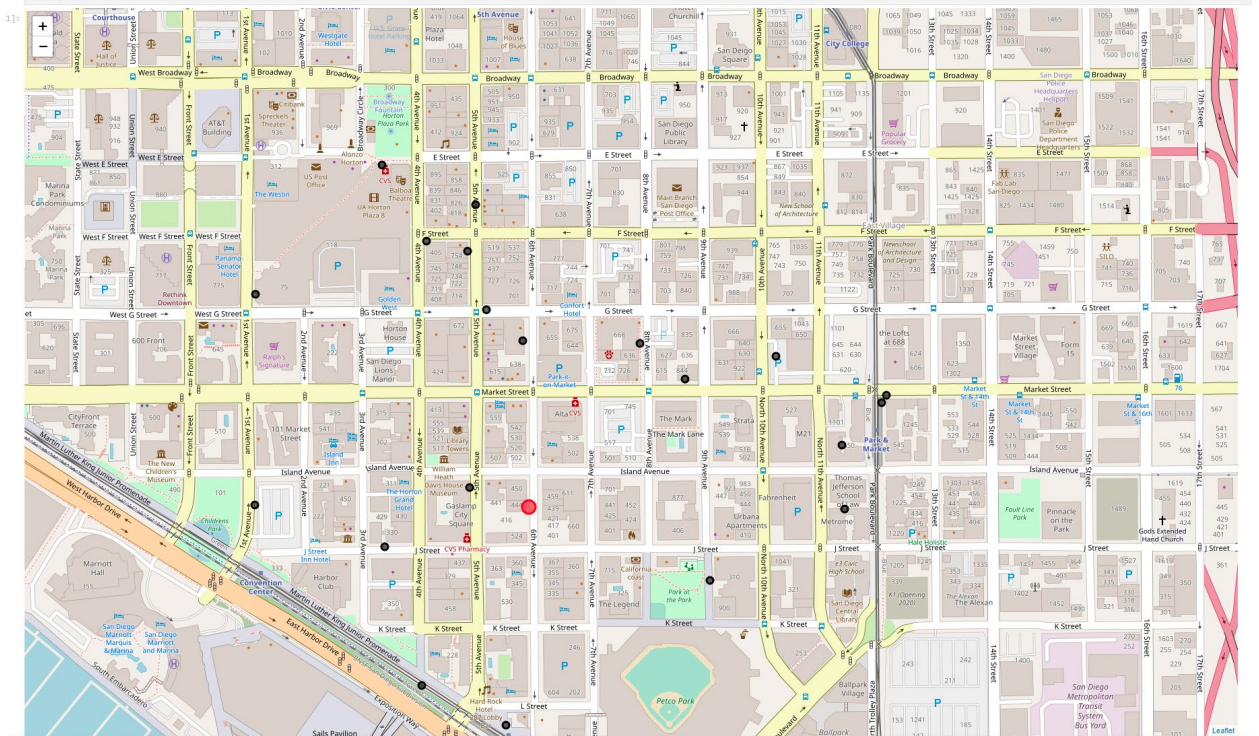

Dots in blue are the location of nightclub in Downtown SD. Omnia Nightclub is one of the famous nightclubs. So we can get data for food trucks around Omnia nightclub using Foursquare API

b. Getting foodtruck venues from Foursquare API near Omnia

```
[206]: df_ft_filtered.name
```

```
[206]: 0              White Rabbit Food Truck
       1                  Linme's Food Truck
       2                  Skyrim Food Truck
       3             garlic scape Food Truck
       4                           Food Shop
       5             Westfield Horton Plaza
       6             Real Steel Truck Stage
       7                 Sundra Indian Food
       8                           Foodfarm
       9        Lima Peruvian Food & Cocktails
       10            Code Blue Tattoo Truck
       11            ShowMe Ice Cream Truck
       12             Sabeih Food Services
       13             Mini Truck Dismantling
       14      Valentine's Mexican Restaurant
       15                     Prestons Truck
       16   Park Blvd Express - Chinese Fast Food
       17                               FIDM
       18                  Azteca Taco Shop
       19         Michos Gourmet Mexican Tacos
       Name: name, dtype: object
```
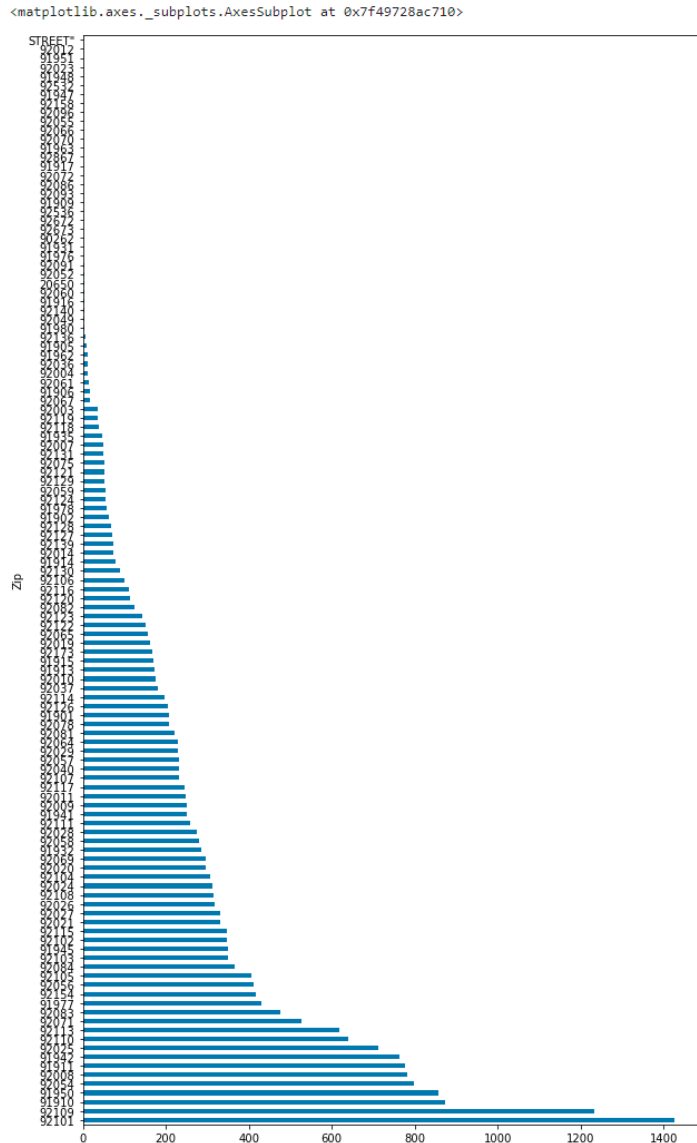
There are not many food truck options around Omnia and this will be a potentially good place to open up a food truck. We should also investigate the crime data for San Diego downtown to determine if having a food truck open very late will be safe.

c. San Diego crime data 2019

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

	Crime type	Place	Description	Date	Time	Address	Zip	Community
0	MOTOR VEHICLE THEFT	NATIONAL CITY	TAKE VEHICLE W/O OWNER'S CONSENT/VEHICLE THEFT...	6/18/2019	6:30:00	2400 BLOCK TIDELANDS AVENUE	91950	NATIONAL CITY
1	BURGLARY	NATIONAL CITY	BURGLARY (RESIDENTIAL) (F)	6/30/2019	9:22:00	200 E BLOCK 12TH STREET	91950	NATIONAL CITY
2	THEFT/LARCENY	NATIONAL CITY	GRAND THEFT:MONEY/LABOR/PROPERTY (F)	6/7/2019	13:38:00	2100 BLOCK HOOVER AVENUE	91950	NATIONAL CITY
3	THEFT/LARCENY	NATIONAL CITY	SHOPLIFTING (M)	7/13/2019	14:17:00	3000 BLOCK PLAZA BONITA ROAD	91950	NATIONAL CITY
4	THEFT/LARCENY	NATIONAL CITY	GRAND THEFT (Theft From Building) (F)	6/28/2019	13:15:00	1500 BLOCK PLAZA BOULEVARD	91950	NATIONAL CITY

Nice, this data frame has the details on crime type, hour and zip code. These are the details that we wanted. Unfortunately, I could not find a data source for coordinates for each crime. We are going to analyze the data using zip code.

The above bar graph shows the number of crimes per zip code. The zip code with the maximum number of crimes is Downtown San Diego and this is the data we are interested in. Now let us make a data frame just for downtown.

d. Data frame for Downtown San Diego:

The above bar graph shows the number of crime in each zipcode. As you can see, 92101 has the highest crime rate. Let us analyse the data further
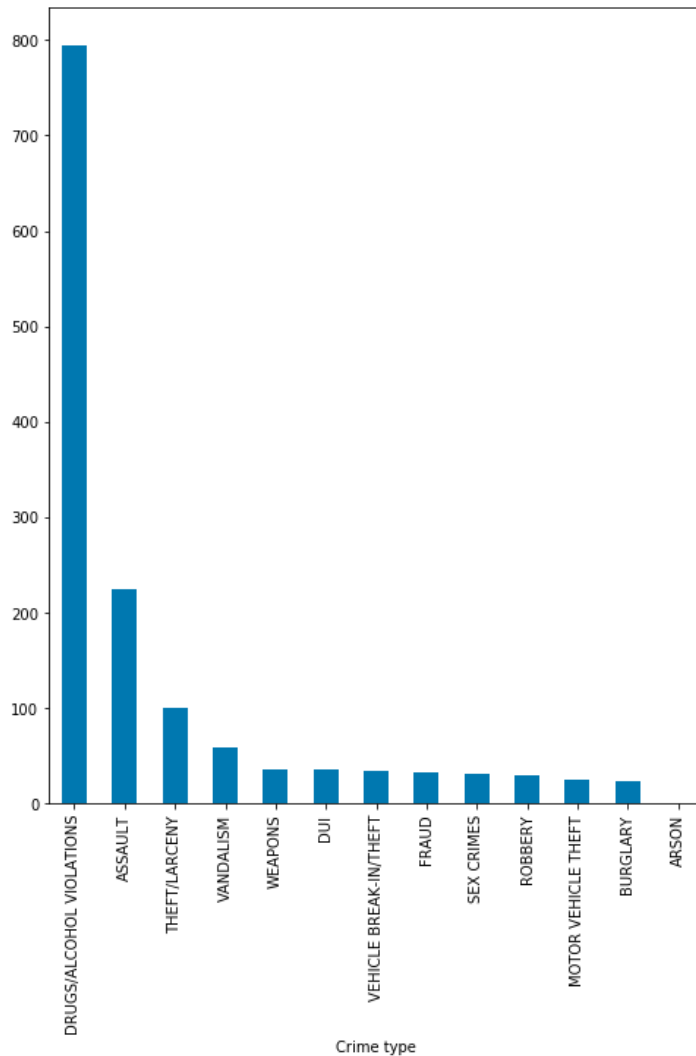
Google search shows that zipcode 92101 is San Diego Downtown

```
[75]: Downtown = df.loc[df['Zip']=='92101']
Downtown.head()
```

[75]:

	Crime type	Place	Description	Date	Time	Address	Zip	Community
10	DRUGS/ALCOHOL VIOLATIONS	SAN DIEGO	POSS CONTRL SUB PARAPHERNALIA	7/17/2019	7:05:00	1500 BLOCK C STREET	92101	SAN DIEGO
29	DRUGS/ALCOHOL VIOLATIONS	SAN DIEGO	DRUNK IN PUBLIC: ALCOHOL, DRUGS, COMBO OR TOLU...	5/6/2019	1:15:00	400 BLOCK MARKET STREET	92101	SAN DIEGO
31	DRUGS/ALCOHOL VIOLATIONS	SAN DIEGO	USE/UNDER INFL OF CONTROLLED SUBS (M)	5/5/2019	22:50:00	100 BLOCK G STREET	92101	SAN DIEGO
32	DRUGS/ALCOHOL VIOLATIONS	SAN DIEGO	USE/UNDER INFL OF CONTROLLED SUBS (M)	5/6/2019	0:55:00	800 BLOCK 05TH AVENUE	92101	SAN DIEGO
33	DRUGS/ALCOHOL VIOLATIONS	SAN DIEGO	DRUNK IN PUBLIC: ALCOHOL, DRUGS, COMBO OR TOLU...	5/5/2019	22:22:00	600 BLOCK 05TH AVENUE	92101	SAN DIEGO

Now that we have a data frame for crimes in Downtown, let us analyze the crime type and the time of most crime in detail.

Interestingly, the maximum number of crimes happening in Downtown is related to Drugs/alcohol violations. Crimes related to assault or burglary are much less.

Now let us investigate on the time of occurrence for the crimes in a 24-hour time period.

```
[39]: Downtown['Hours'] = pd.to_datetime(Downtown['Time'], format = '%H:%M:%S').dt.hour
```

```
/home/jupyterlab/conda/envs/python/lib/python3.6/site-packages/ipykernel_launcher.py:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  """Entry point for launching an IPython kernel.
```
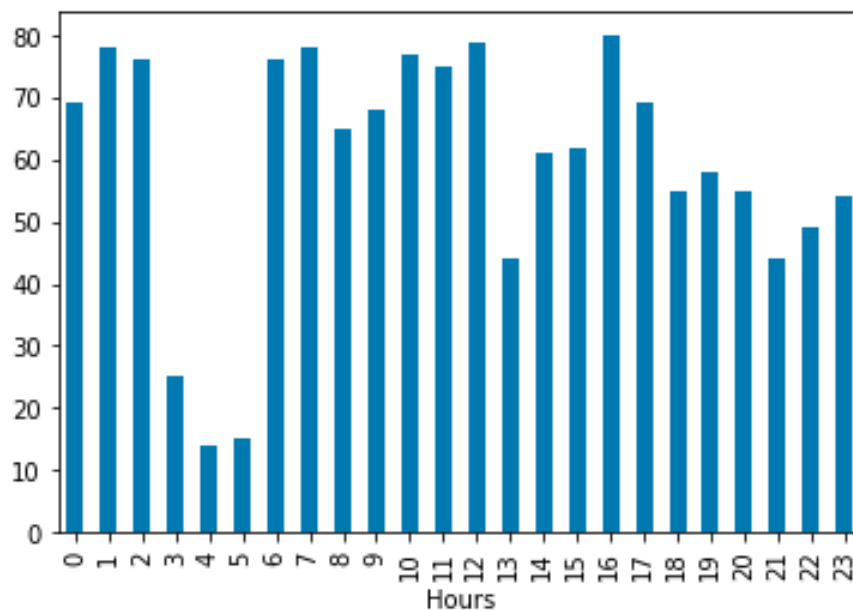
```
[40]: Downtown.head()
```

[40]:

	Crime type	Place	Description	Date	Time	Address	Zip	Community	Hours
10	DRUGS/ALCOHOL VIOLATIONS	SAN DIEGO	POSS CONTRL SUB PARAPHERNALIA	7/17/2019	7:05:00	1500 BLOCK C STREET	92101	SAN DIEGO	7
29	DRUGS/ALCOHOL VIOLATIONS	SAN DIEGO	DRUNK IN PUBLIC: ALCOHOL, DRUGS, COMBO OR TOLU...	5/6/2019	1:15:00	400 BLOCK MARKET STREET	92101	SAN DIEGO	1
31	DRUGS/ALCOHOL VIOLATIONS	SAN DIEGO	USE/UNDER INFL OF CONTROLLED SUBS (M)	5/5/2019	22:50:00	100 BLOCK G STREET	92101	SAN DIEGO	22
32	DRUGS/ALCOHOL VIOLATIONS	SAN DIEGO	USE/UNDER INFL OF CONTROLLED SUBS (M)	5/6/2019	0:55:00	800 BLOCK 05TH AVENUE	92101	SAN DIEGO	0
33	DRUGS/ALCOHOL VIOLATIONS	SAN DIEGO	DRUNK IN PUBLIC: ALCOHOL, DRUGS, COMBO OR TOLU...	5/5/2019	22:22:00	600 BLOCK 05TH AVENUE	92101	SAN DIEGO	22

```
[43]: Downtown.groupby("Hours").size().plot(kind='bar')
```

```
[43]: <matplotlib.axes._subplots.AxesSubplot at 0x7f49723942b0>
```


In the data frame, time is given in HH:MM:SS format. However, we wanted only the hours. So, I have only extracted the hour values for each row into a new column "Hours". I have also plotted a bar graph with number of crimes per 24-hour period.

From the graph, we can infer that the number of crimes in the late night (1-2am) is about the same as the number of crimes in the morning hours (6am-12pm). So late night is not more unsafe than during the day. We also know that most of the crimes committed are related to alcohol and drugs.

Conclusion:

Our client could potentially open a food truck close to Omnia hotel in San Diego downtown as there are not many food truck options in the area and downtown SD is not particularly unsafe during the late-night hours.

However, there are other factors to be considered before starting a food truck business such as space availability, city restrictions, etc.