Assignment 1

[San Francisco Fire Department Calls Analysis]

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Introduction

The aim of the report is to analyse the involvement of Unit 71 of the fire department of San Francisco in calls where medical or Life-Threatening incidents are reported. The basic objective of the report is to explore the time taken by fire department team on the different priorities of the Calls.

Methods

The Data is extracted from data.sfgov.org. and the creation date for the same is December 18, 2015.The calls received to the fire department are recorded in the database and a unique 9-digit number is assigned by the dispatch unit. Each call would be then given a unique 8-digit incident number.

Incidents are further categorized into call type and call type group. Call type would indicate the type of incidents such as Medical, Escalator rescue, Fire, Aircraft emergency etc.
Call type groups are classified as Alarms, Non-Life Threatening, Potential-Life Threatening etc. Time spent on the calls are recorded as Call Date, Response time, Available time etc.

Microsoft Excel Software is used to analyse this dataset. It is one of the top tools for data analysis and the built-in pivot tables are arguably the most popular analytic tool.

Results

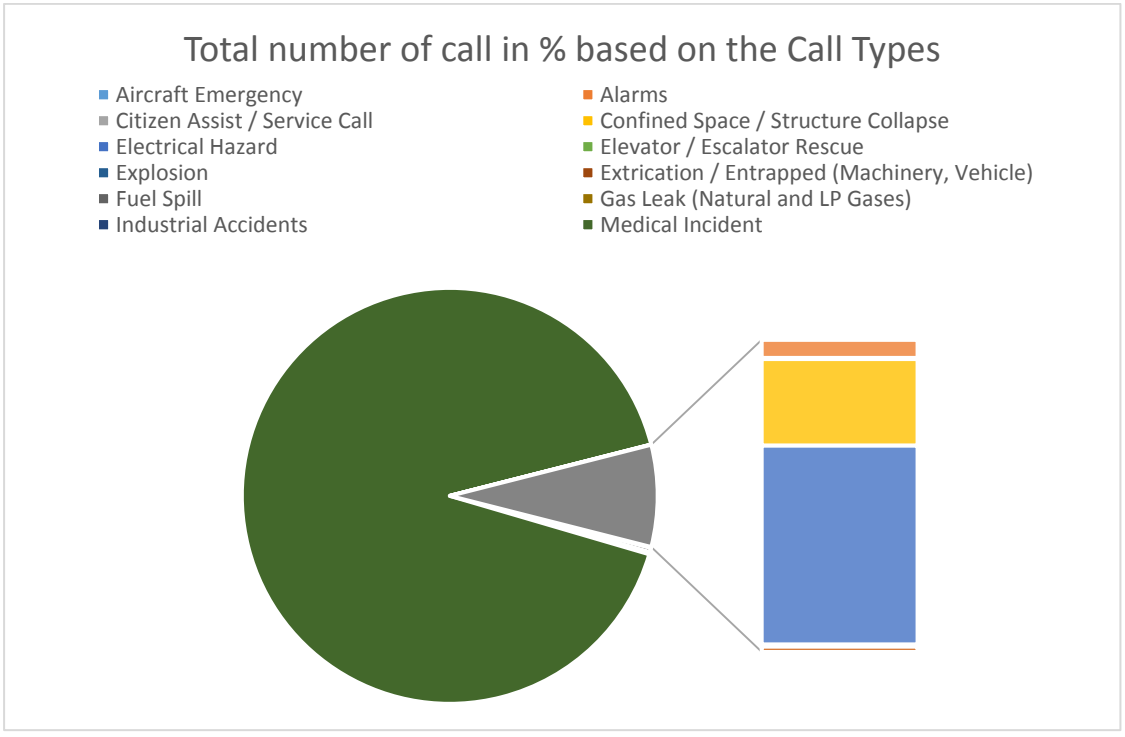
We can follow the below procedure to analyse the dataset.

1) Using Pivot table on the dataset we can find out the total number of calls made to the fire department of San Francisco from the different cities. These values are then shown as Percentage of the total calls to effectively analyse the data.

City	(All)

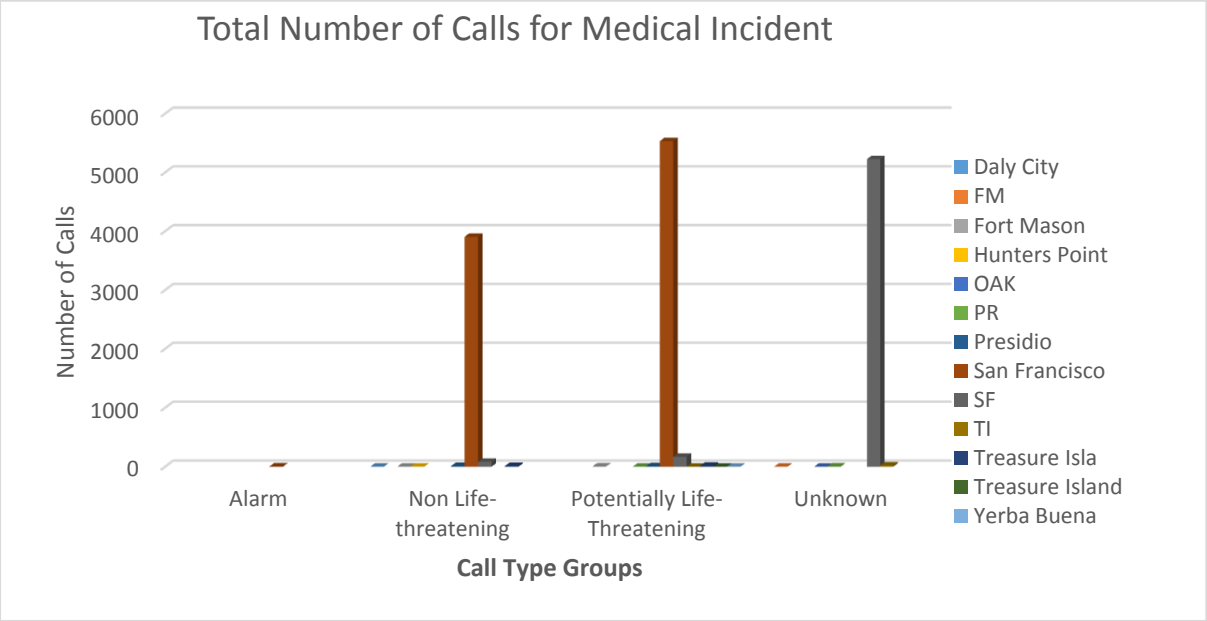
Row Labels	Count of Call Number
Aircraft Emergency	0.01%
Alarms	0.07%
Citizen Assist / Service Call	0.37%
Confined Space / Structure Collapse	0.01%
Electrical Hazard	0.01%
Elevator / Escalator Rescue	0.04%
Explosion	0.02%
Extrication / Entrapped (Machinery, Vehicle)	0.01%
Fuel Spill	0.01%
Gas Leak (Natural and LP Gases)	0.01%
Industrial Accidents	0.03%
Medical Incident	91.46%
Odor (Strange / Unknown)	0.02%
Other	0.46%
Outside Fire	0.03%
Structure Fire	2.20%
Traffic Collision	5.07%
Train / Rail Incident	0.01%
Vehicle Fire	0.04%
Water Rescue	0.13%
Grand Total	**100.00%**

Now we can use the features of the Excel software such as Chart Representation of the data in pivot table. This will give us the visual representation of the dataset. Around 91% of the total calls received to the fire department are categorized as Medical Incidents.



2) Using Pivot table, the dataset can be drilled down further considering only Medical Incidents and category of call type groups for different cities. Now, use of bar graph is done to represent the data.

   Highest number of calls are received from the San Francisco compared to the other cities and the type of the calls received are under the category of nonlife threatening and potentially life threatening.



3) We can calculate the total time spent on each call based on the call types.
   To calculate the total time spent on the call, we will consider Response Date time & Available Date time.

   Limitations:
   a. For some of the calls the value in the field Response time is blank.
   b. For some of the calls the value in the field Available time is blank.
   c. For some of the calls the value in the field Available time is smaller than Response time.
   d. For some of the calls the values in the both the fields are empty.

Time spent on each call is calculated as the difference between Available time and Response time. Since the dataset is having above limitation there are 2 ways by which we can analyse this data.

- Making the values of the fields Available time and Response time as same. This will give us the difference between the 2 fields as "0". Hence it will not affect the output of the result while calculating the total time spent.

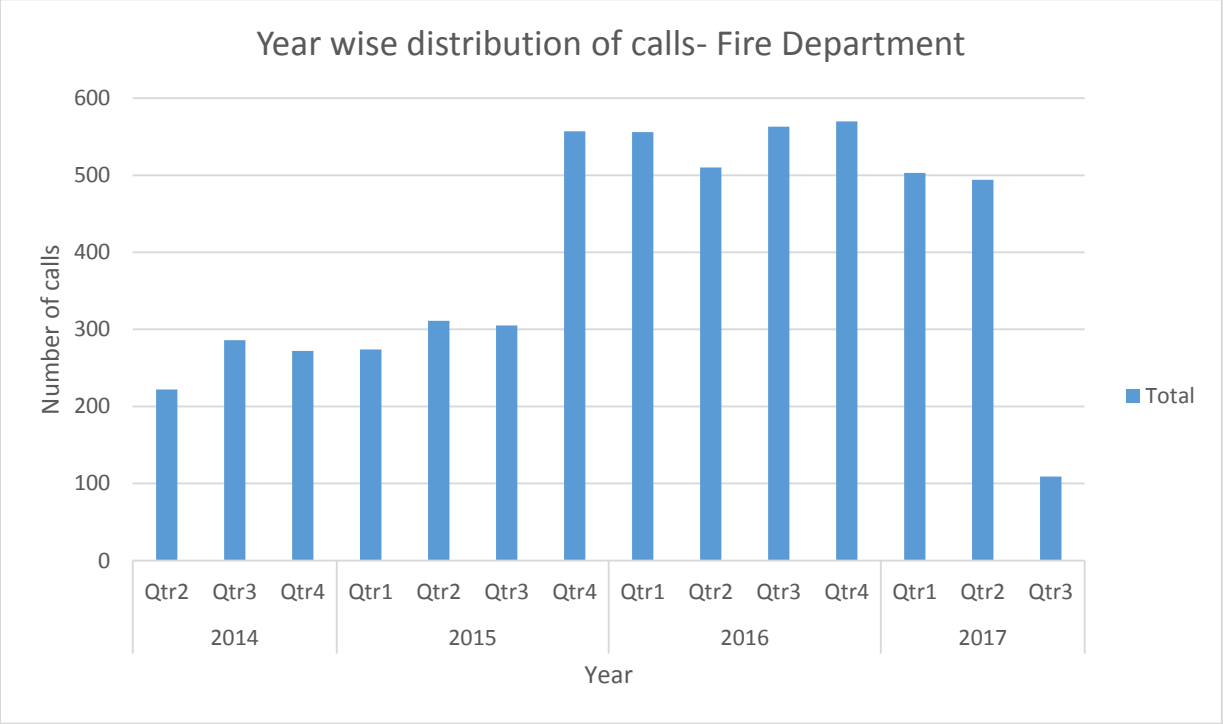
- We can calculate the average time spent for some sample of data and use that data in the blank values of the fields. This will give us the results which will not be biased.

4) Based on the above results we can further filter down the dataset to give the details of the time spent on calls based on the Call Type Group. (i.e Alarm, Non-Life Threatening, Potentially Life Threatening, Unknown)
   Using the formulas in the Excel Software we can sum up the time spent on calls for Individual Call Type Group.

5) We can also get the details of calls received to the fire department on quarterly basis. We have filtered the data based on City (i.e San Francisco), Call Type Group (i.e Potentially Life Threatening) And Call type as Medical.
   Using the bar graph representation of the pivot table data we can plot the dataset.

City	San Francisco
Call Type Group	Potentially Life-Threatening
Call Type	Medical Incident

Row Labels	Count of Call Number
2014	**780**
Qtr2	**222**
Qtr3	**286**
Qtr4	**272**
2015	**1447**
Qtr1	**274**
Qtr2	**311**
Qtr3	**305**
Qtr4	**557**
2016	**2199**
Qtr1	**556**
Qtr2	**510**
Qtr3	**563**
Qtr4	**570**
2017	**1106**
Qtr1	**503**
Qtr2	**494**
Qtr3	**109**
Grand Total	**5532**



Conclusion

Based on the analysis we can derive the following conclusion.

a. Number of calls received to the fire department are highest for San Francisco city.
b. 91% of the total calls received to the fire department are categorized as Medical Incidents.
c. In the Medical Incident Category, Number of calls for Potentially Life-Threatening group is highest for San Francisco city.
d. Time spent on each call is calculated using the difference between Available time and Response time.

Reference

The dataset is referenced from data.sfgov.org. More information can be extracted from the link https://data.sfgov.org/Public-Safety/Fire-Department-Calls-for-Service/nuek-vuh3

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