911 Emergency Calls: Data Analytics

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Our Data

Montgomery County, PA 911 Calls

| lat	lng	desc	zip	title	timeStamp	twp	addr
40.2978759	-75.5812935	REINDEER CT & DEAD END; NEW HANOVER; Station 332; 2015-12-10 @ 17:10:52;	19525	EMS: BACK PAINS/INJURY	12/10/2015 17:10	NEW HANOVER	REINDEER CT & DEAD END
40.2580614	-75.2646799	BRIAR PATH & WHITEMARSH LN; HATFIELD TOWNSHIP; Station 345; 2015-12-10 @ 17:29:21;	19446	EMS: DIABETIC EMERGENCY	12/10/2015 17:29	HATFIELD TOWNSHIP	BRIAR PATH & WHITEMARSH LN
40.1211818	-75.3519752	HAWS AVE; NORRISTOWN; 2015-12-10 @ 14:39:21-Station:STA27;	19401	Fire: GAS-ODOR/LEAK	12/10/2015 14:39	NORRISTOWN	HAWS AVE
40.116153	-75.343513	AIRY ST & SWEDE ST; NORRISTOWN; Station 308A; 2015-12-10 @ 16:47:36;	19401	EMS: CARDIAC EMERGENCY	12/10/2015 16:47	NORRISTOWN	AIRY ST & SWEDE ST

Goal

1. Find interesting information hidden in the data

- Most common emergencies
- Correlation between time or month and occurence of a specific emergency

2. Test whether our predictions are true:

- Traffic accidents are the most common emergency
- They probably occur late at night due to drunk/tired drivers
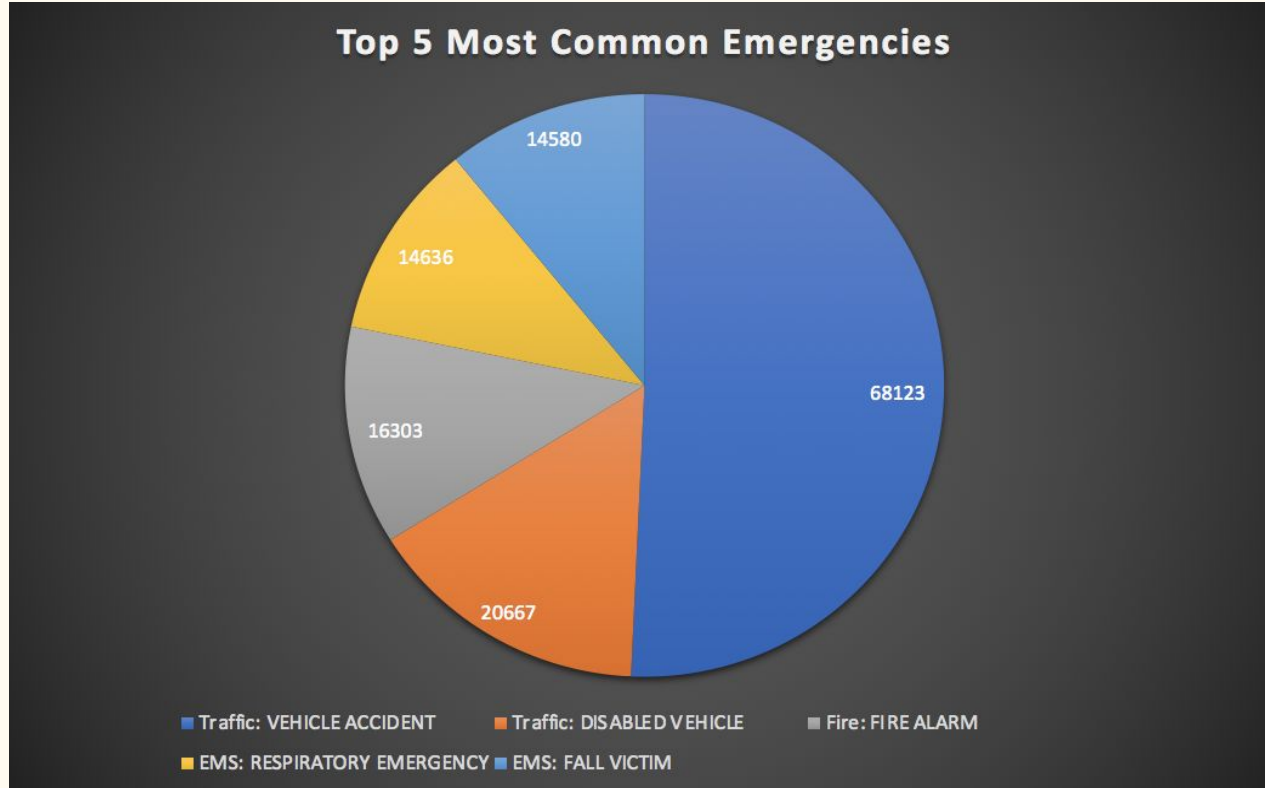- Some medical emergencies occur more at certain times of the day

Results: Emergency Categories
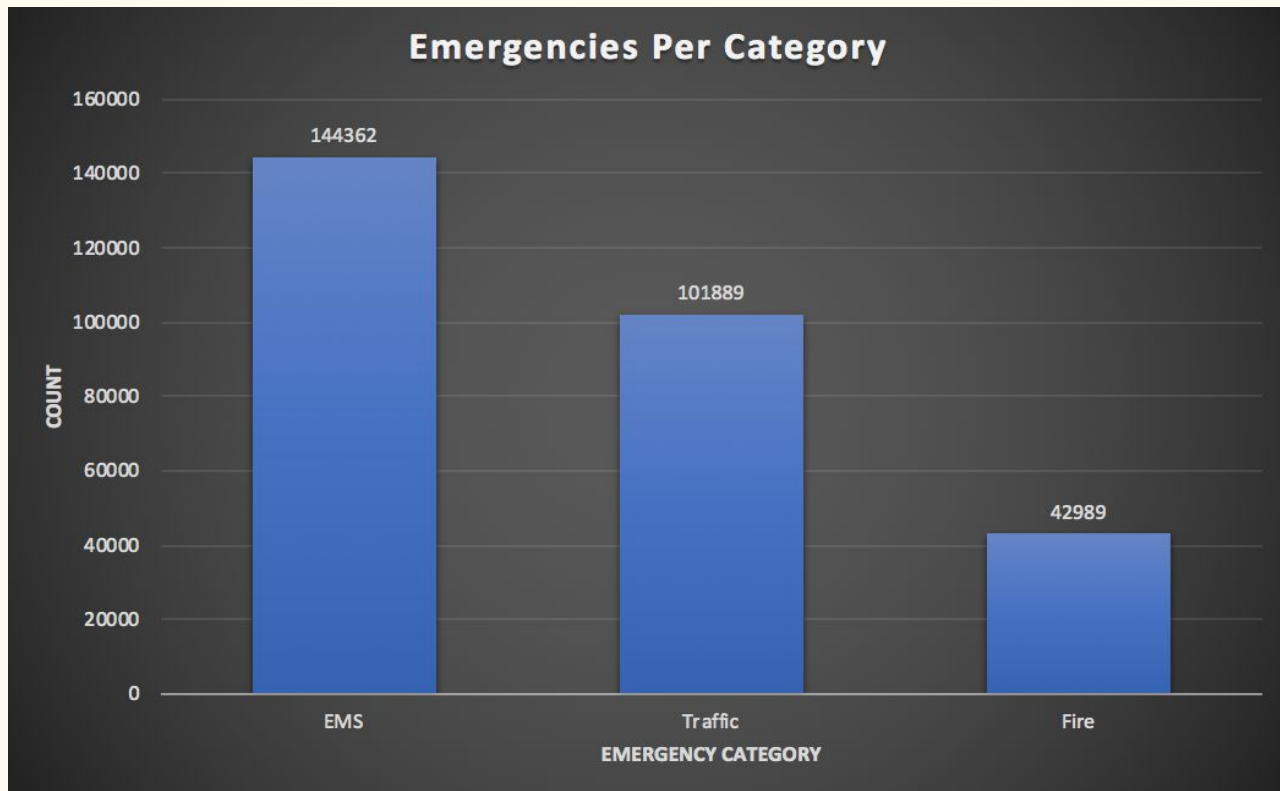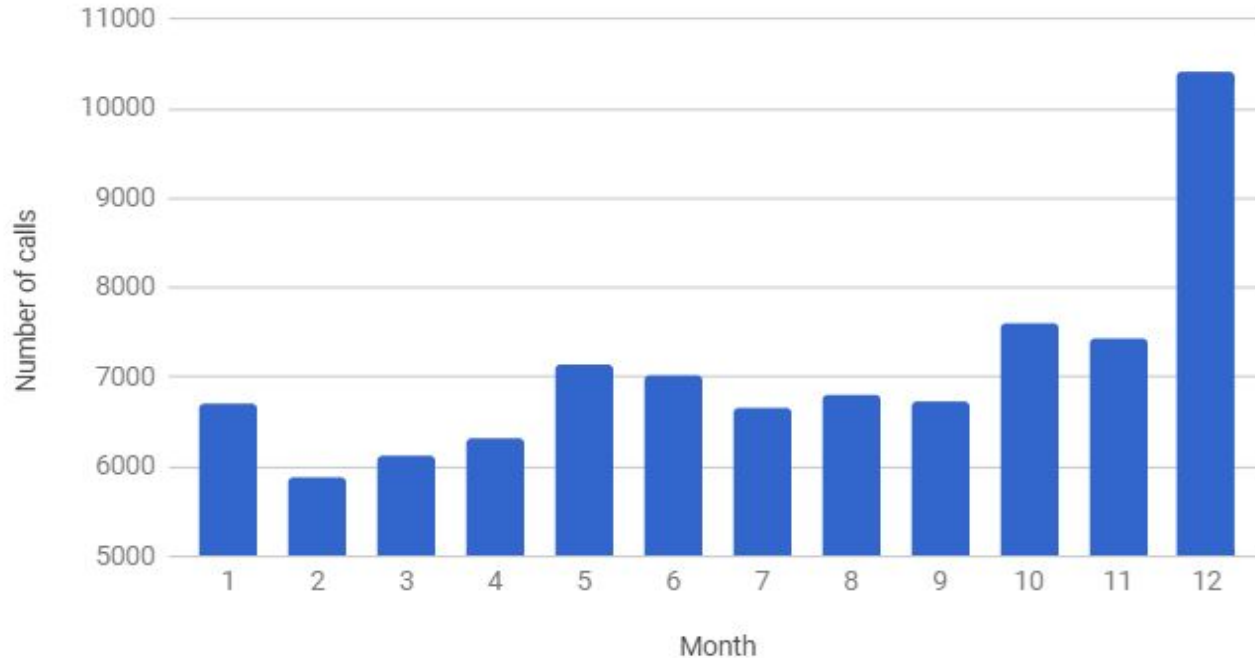
Results: Most Common Emergency Per Category
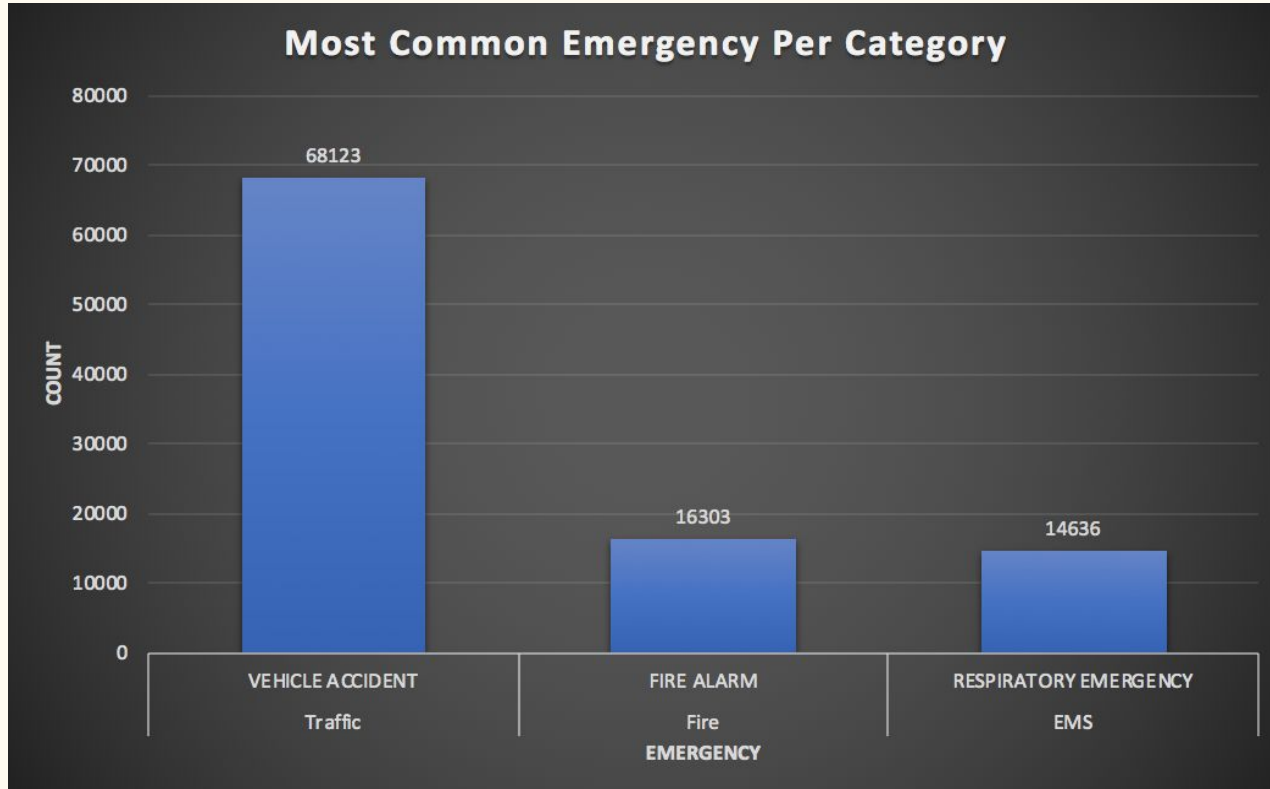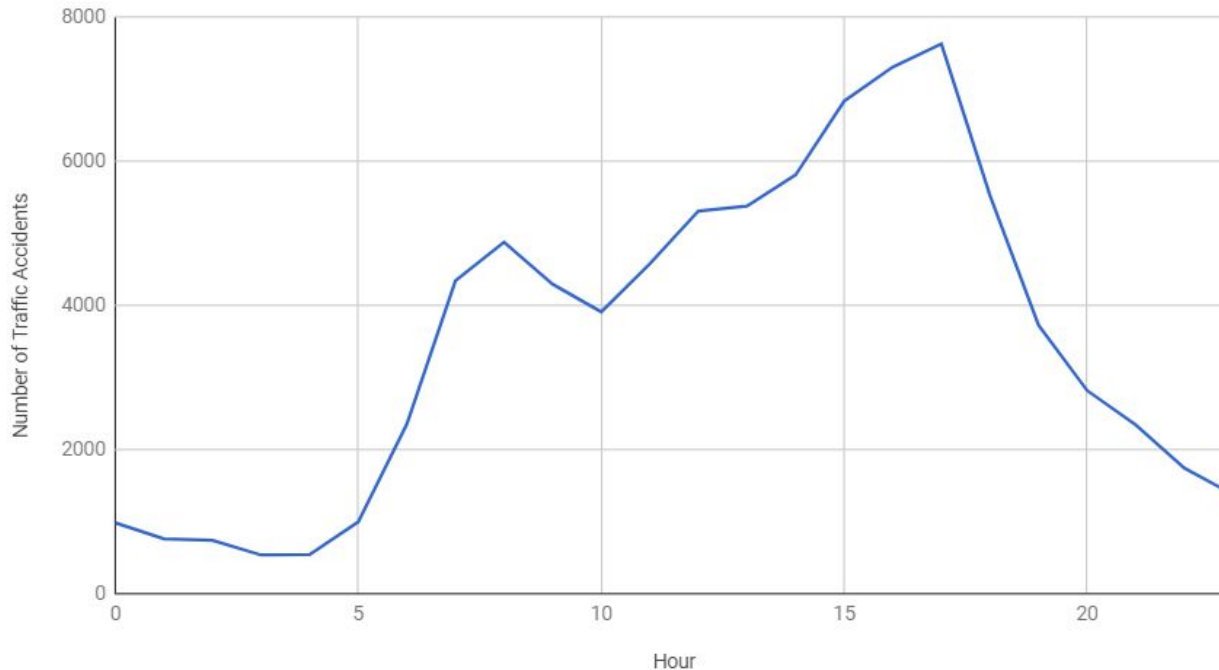
Results: Most Common Emergencies Overall

Results: Vehicle Accidents
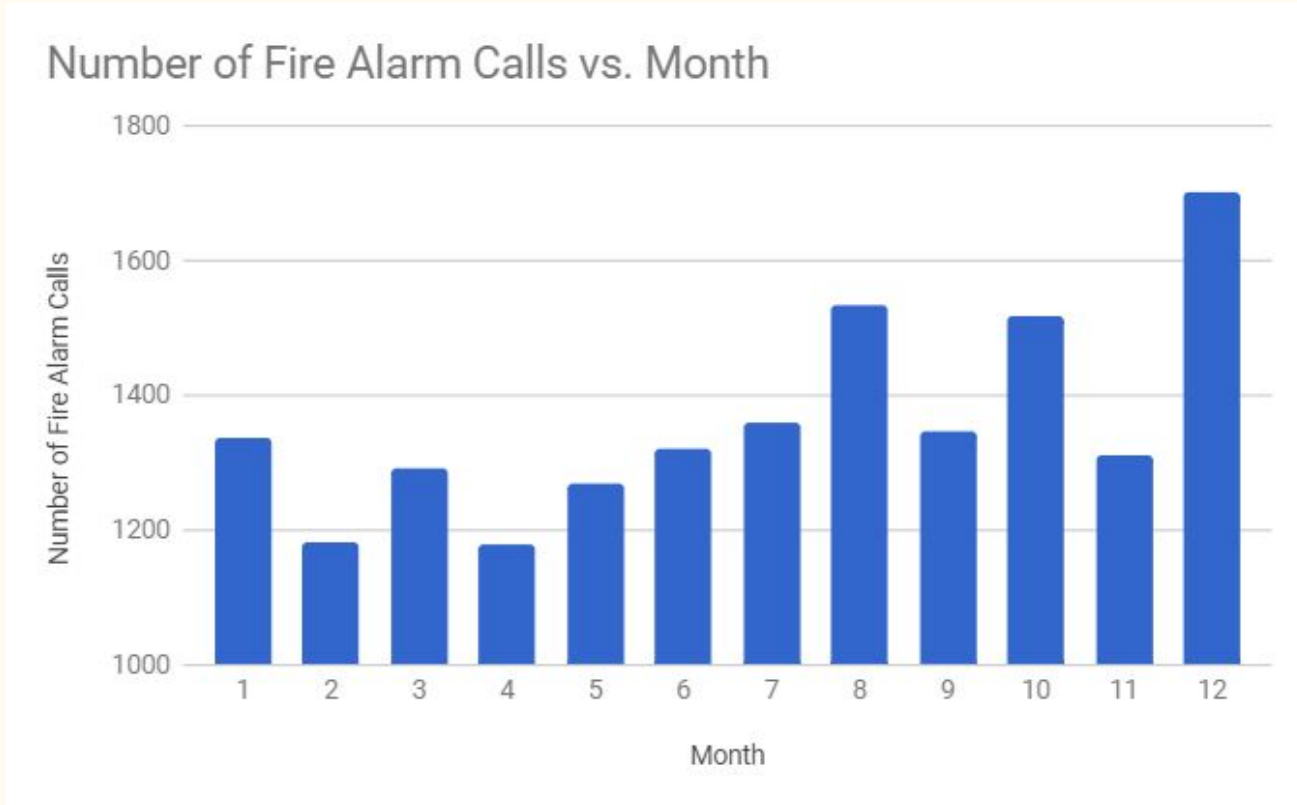

Vehicle Accidents Per Month

Results: Vehicle Accidents

Results: Fire Alarms

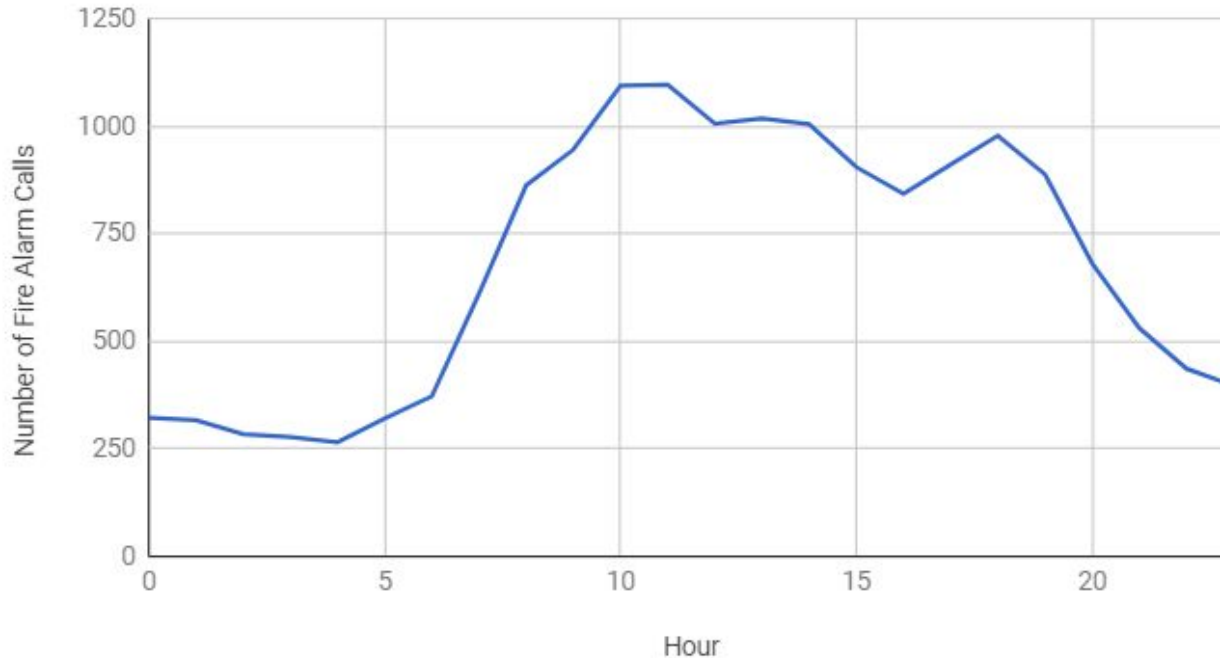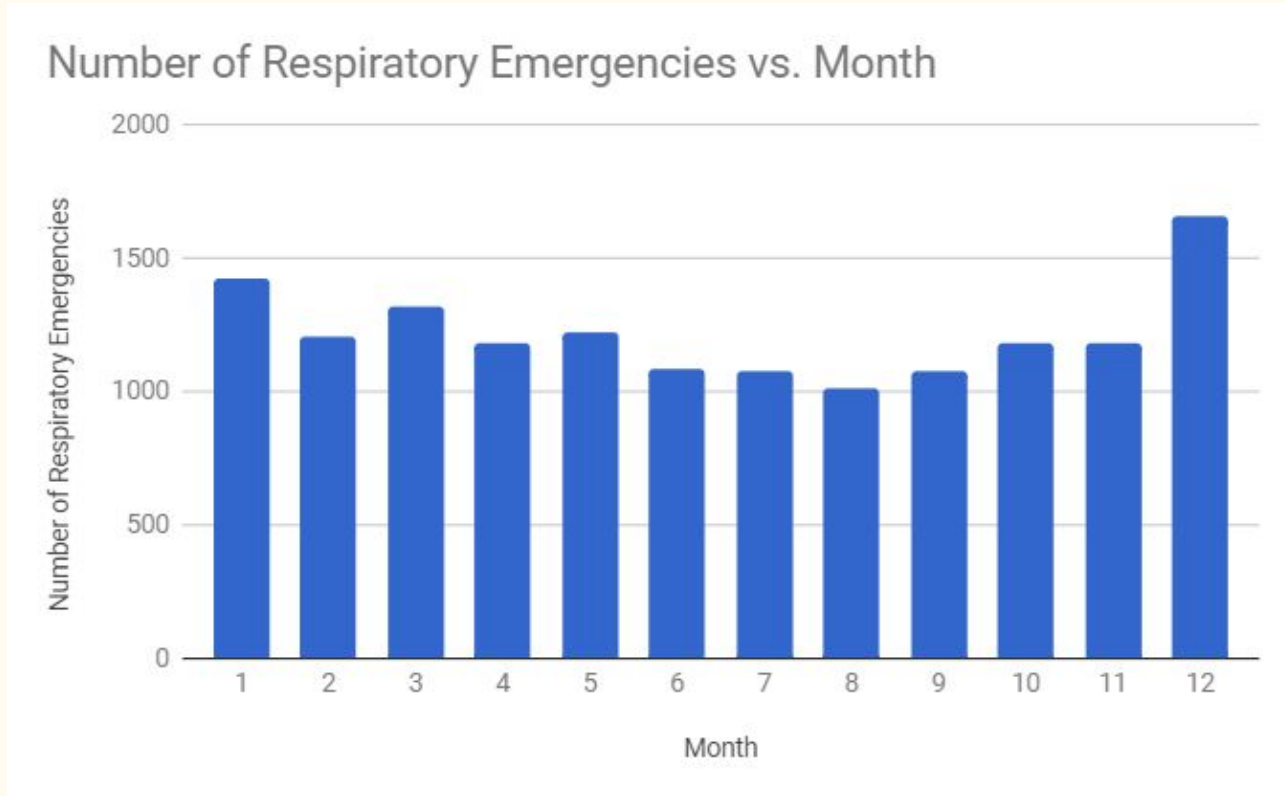Number of Fire Alarm Calls vs. Month

Results: Fire Alarms

Results: Respiratory Emergencies
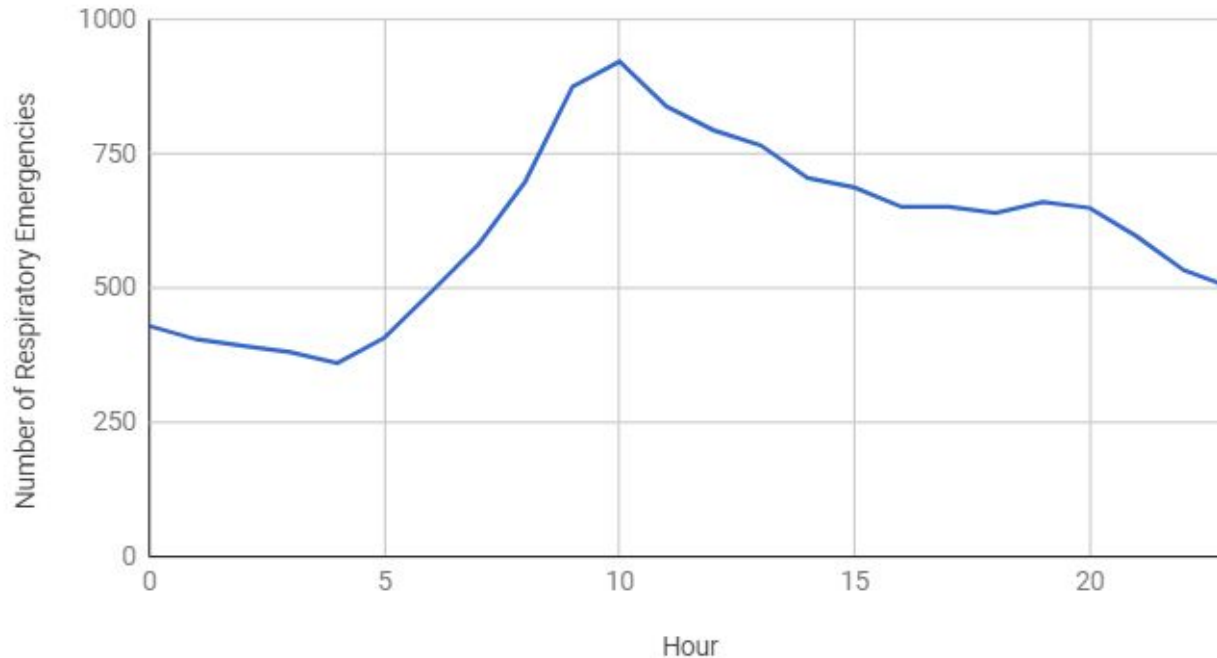

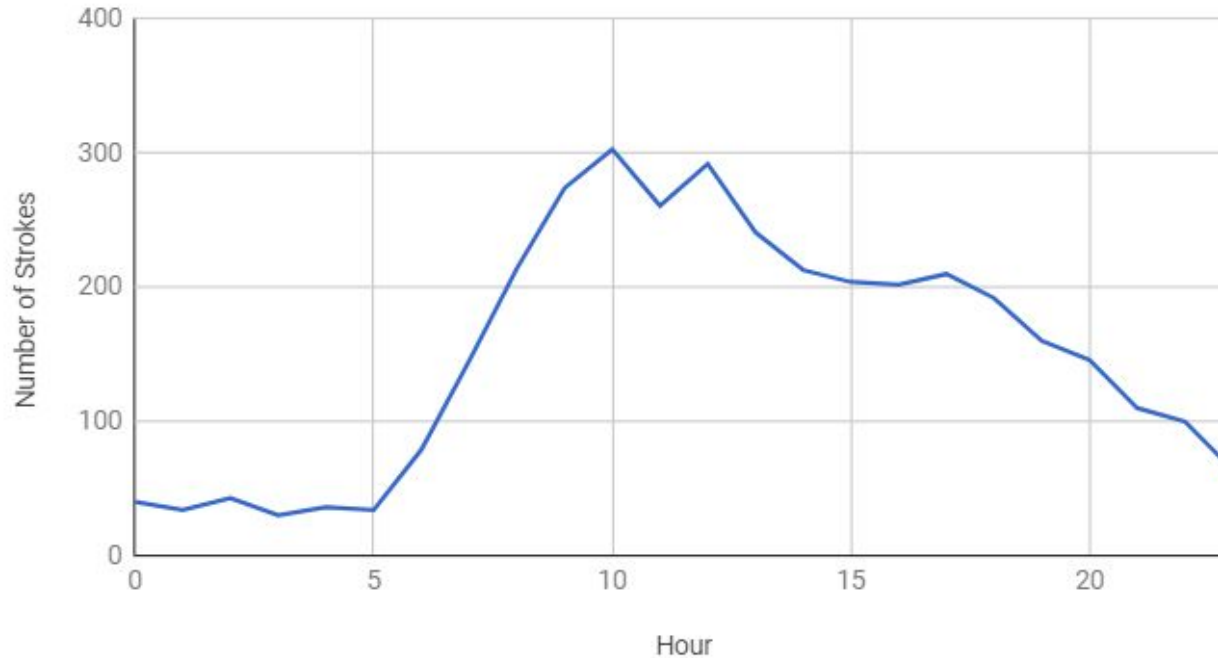Number of Respiratory Emergencies vs. Month

Results: Respiratory Emergencies

Number of Respiratory Emergencies vs. Hour

Results: Strokes

Number of Strokes vs. Hour

Code Review

Vehicle Accidents by Month

```
lines
.map(line => line.split(","))
.map(arr => (arr(5).split(" ")(0).split('-'), arr(4)))
.filter(line => line._1.size == 3)
.filter(line => line._2.contains("VEHICLE ACCIDENT"))
.map(line => (line._1(1), 1))
.countByKey()
.toSeq.sortBy{ case (k, v) => -v }
.foreach{println(_)};
```

Most Common Emergency Overall

```
lines
.map(line =>(line.split(",")(4).trim(),1))
.reduceByKey(_+_)
.sortBy(r => (r._2 * -1, r._1)).collect().take(n)
```

Challenges

- Incomplete/missing data
- Overlap between categories of data (e.g. "Traffic Accident" listed in both EMS and Fire)
- Sharing the IntelliJ project
- Generating conclusions from counterintuitive data

Conclusions

- Some data fits expectations
  - Traffic accidents are by far the most common emergency
  - Driving in the winter is more dangerous
  - Fire alarms are triggered while people are awake and cooking
- Some data revealed surprising trends
  - EMS respond to a high volume of people falling over
  - Rush hour is more dangerous for driving than late at night
  - From 5am to 10am respiratory emergencies triple
  - Calls for strokes are much lower overnight