Best Truck(_!)

June 8, 2018

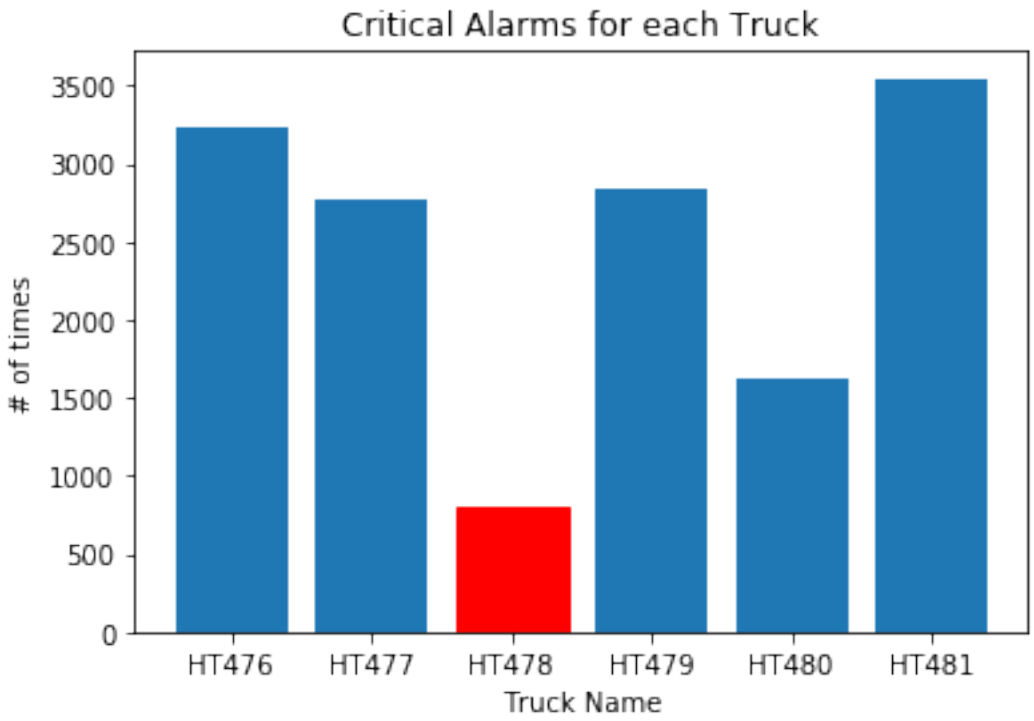
In [4]:
```
import pandas as pd
import matplotlib.pyplot as plt
import numpy as np
```

0.1 Exploration of Best Truck (Maybe!)

0.2 The following shows the number of critical alarms received by each truck

0.3 It is obtained by looking at the level 1 entries in Notification Details Report

In [5]:
```
NDR = pd.read_csv('C:/Users/codyg/Desktop/BCData2018/Maintenance/NotificationDetailsRepo

equipValues = NDR['Level'] # filtering Level

equipName = NDR['EquipmentName'] # filtering Truck Names

myDict = set(equipName) # finding the name of Trucks

myDictList = list(myDict) # set to list

Truck = [0]*len(myDictList) # Truck is a list of number 1 alarms

for i in range (len(equipValues)):
    if equipValues[i] == 1:
        current_Truck = myDictList.index(equipName[i])
        Truck[current_Truck] += 1

minCritical = Truck.index(min(Truck))

barlist = plt.bar(myDictList, Truck)
barlist[minCritical].set_color('r')
plt.title('Critical Alarms for each Truck')
plt.ylabel('# of times')
plt.xlabel('Truck Name')

del NDR
```

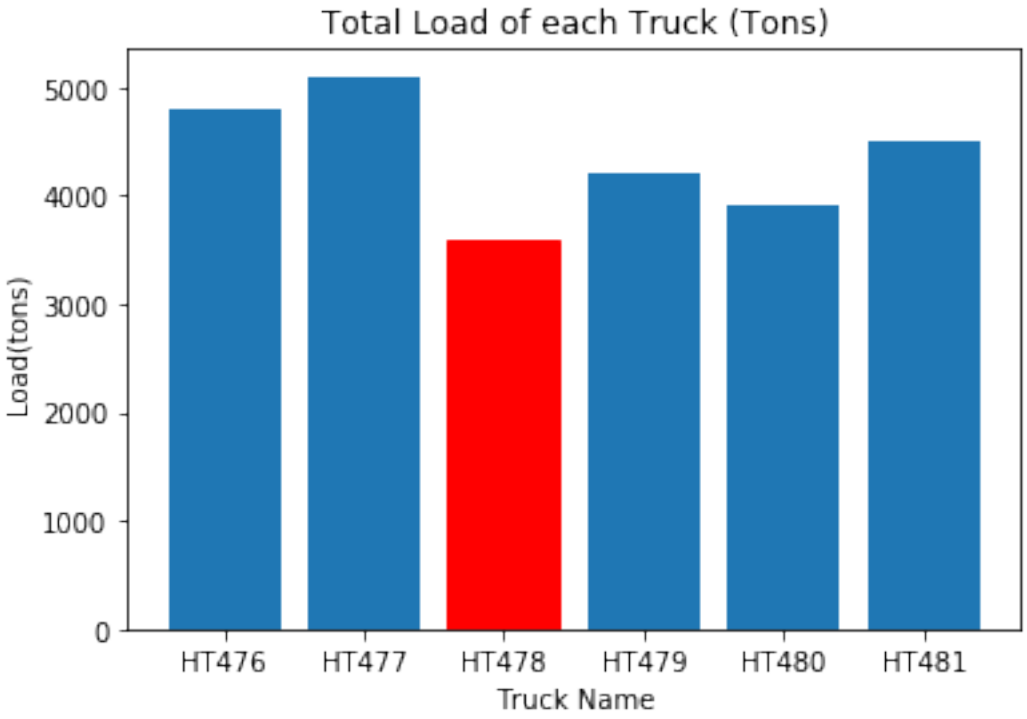


0.4 seems 478 does a great job

0.5 Truck Loads

```
In [3]: TPrS = pd.read_csv('C:/Users/codyg/Desktop/BCData2018//Production/TruckProductionSummary

        equipNo = TPrS['EquipmentNumber']

        Dict = set(equipNo)

        DictList = list(Dict)

        loadOfTrucks = TPrS['LoadTons']

        TotalLoad = [0] * len(DictList)
        for i in range (len(TotalLoad)):
            current_Truck = DictList.index(equipNo[i])
            TotalLoad[current_Truck] = TotalLoad[current_Truck] + loadOfTrucks[i]

        minCritical = Truck.index(min(Truck))

        barlist = plt.bar(DictList, TotalLoad)
        barlist[minCritical].set_color('r')
        plt.title('Total Load of each Truck (Tons)')
```

```
plt.ylabel('Load(tons)')
plt.xlabel('Truck Name')

del TPrS
```

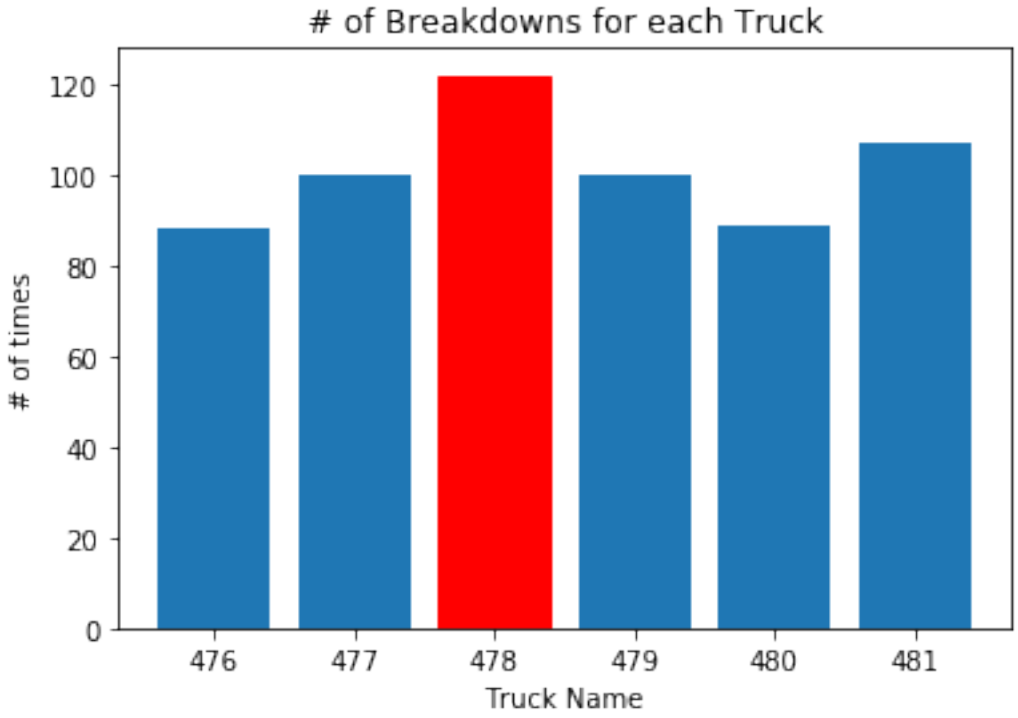


0.6 Seems to be promising, let's look at some other data

0.7 Number of breakdowns

```
In [4]: WO = pd.read_csv('C:/Users/codyg/Desktop/BCData2018/Maintenance/WorkOrders.csv')

        probType = WO['PROBTYPE']

        compID = WO['COMPID']

        myDict = set(compID)

        myDictList = list(myDict)

        breakdownsNo = [0]*len(myDictList) # breakdownsNo is a list of number of breakdowns

        for i in range (len(WO)):
            if probType[i] == 'Breakdown':
                current_Truck = myDictList.index(compID[i])
```

```
        breakdownsNo[current_Truck] += 1

maxBreakdowns = breakdownsNo.index(max(breakdownsNo))

barlist = plt.bar(myDictList, breakdownsNo)
barlist[maxBreakdowns].set_color('r')
plt.title('# of Breakdowns for each Truck')
plt.ylabel('# of times')
plt.xlabel('Truck Name')

del WO
```



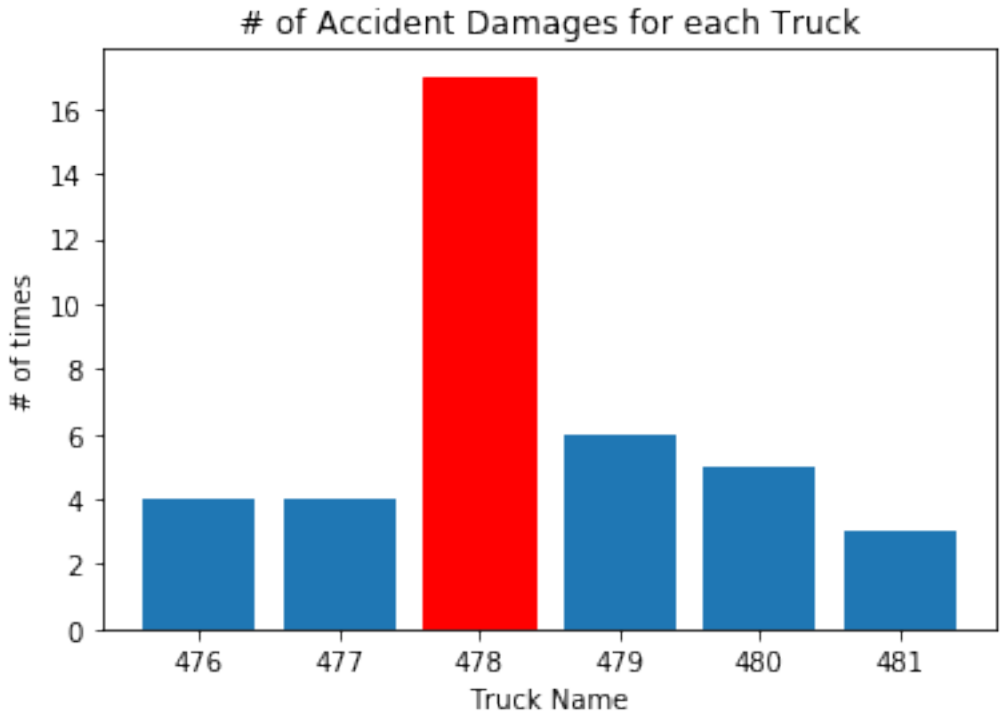
0.8 Not good! Let's look at number of accidents

0.9 Number of Accidents

```
In [5]: WO = pd.read_csv('C:/Users/codyg/Desktop/BCData2018/Maintenance/WorkOrders.csv')

        probType = WO['PROBTYPE']

        compID = WO['COMPID']

        AccidentDamageNo = [0]*len(myDictList)
```

```
myDict = set(compID)

myDictList = list(myDict)
for i in range (len(WO)):
    if probType[i] == 'Accident Damage':
        current_Truck = myDictList.index(compID[i])
        AccidentDamageNo[current_Truck] += 1

maxAccidentDamage = AccidentDamageNo.index(max(AccidentDamageNo))

barlist = plt.bar(myDictList, AccidentDamageNo)
barlist[maxAccidentDamage].set_color('r')
plt.title('# of Accident Damages for each Truck')
plt.ylabel('# of times')
plt.xlabel('Truck Name')
```

Out[5]: Text(0.5,0,'Truck Name')



0.10 Not good either!

0.11 Possible reasons:

0.12 1. Error in data

0.13 2. Some components provide multiple alarms in other trucks,

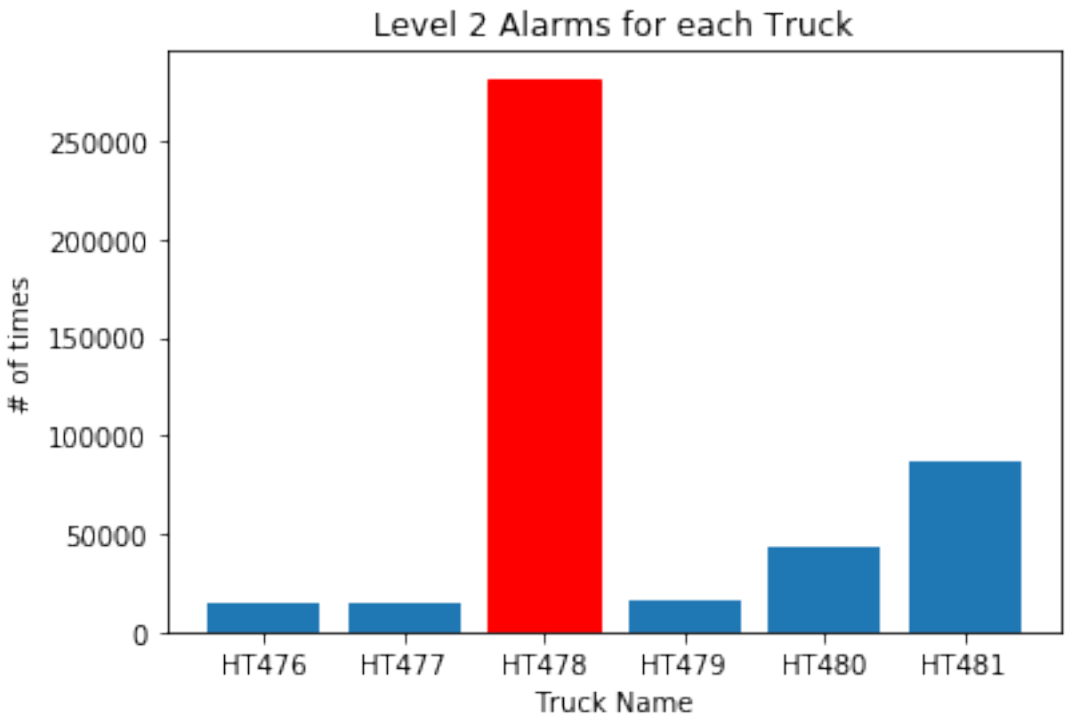
0.14 hence more alarms in other trucks

0.15 3. Sometimes, truck drivers do not notice the alarms, which partly explains

0.16 the reason behind huge numer of accidents and breakdowns

0.17 Also:

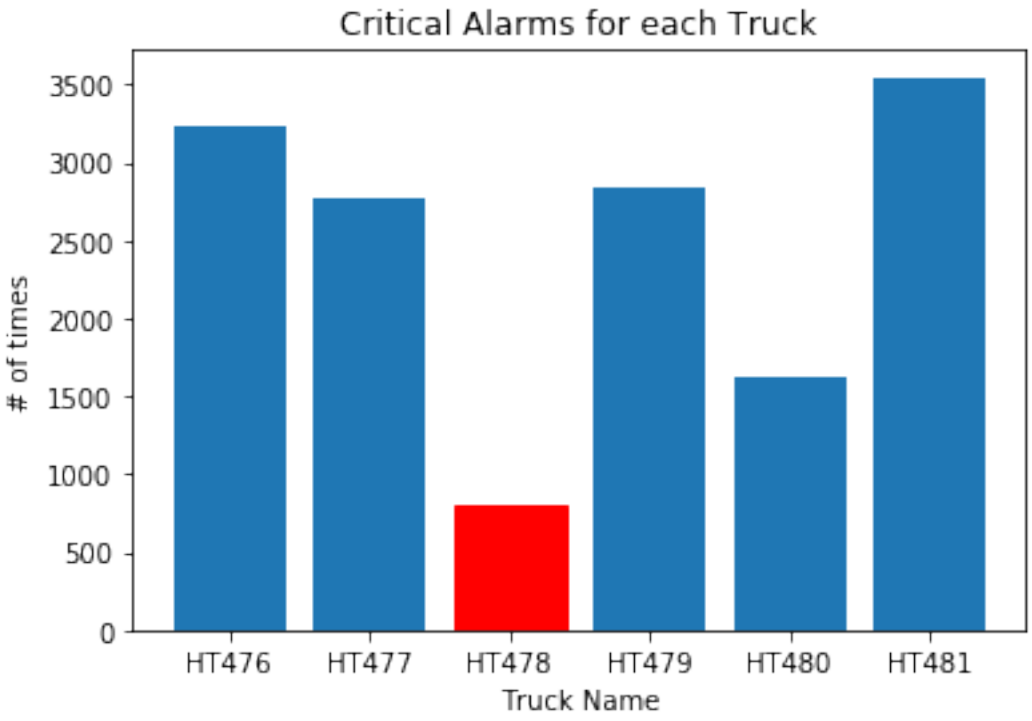
```
In [11]: NDR = pd.read_csv('C:/Users/codyg/Desktop/BCData2018/Maintenance/NotificationDetailsRep

         equipValues = NDR['Level'] # filtering Level

         equipName = NDR['EquipmentName'] # filtering Truck Names

         myDict = set(equipName) # finding the name of Trucks

         myDictList = list(myDict) # set to list

         Alarm2 = [0]*len(myDictList) # Alarm2 is a list of number 2 alarms
         for i in range (len(equipValues)):
             if equipValues[i] == 2:
                 current_Truck = myDictList.index(equipName[i])
                 Alarm2[current_Truck] += 1

         maxAlarm2 = Alarm2.index(max(Alarm2))

         barlist = plt.bar(myDictList, Alarm2)
         barlist[maxAlarm2].set_color('r')
         plt.title('Level 2 Alarms for each Truck')
         plt.ylabel('# of times')
         plt.xlabel('Truck Name')


         del NDR
```

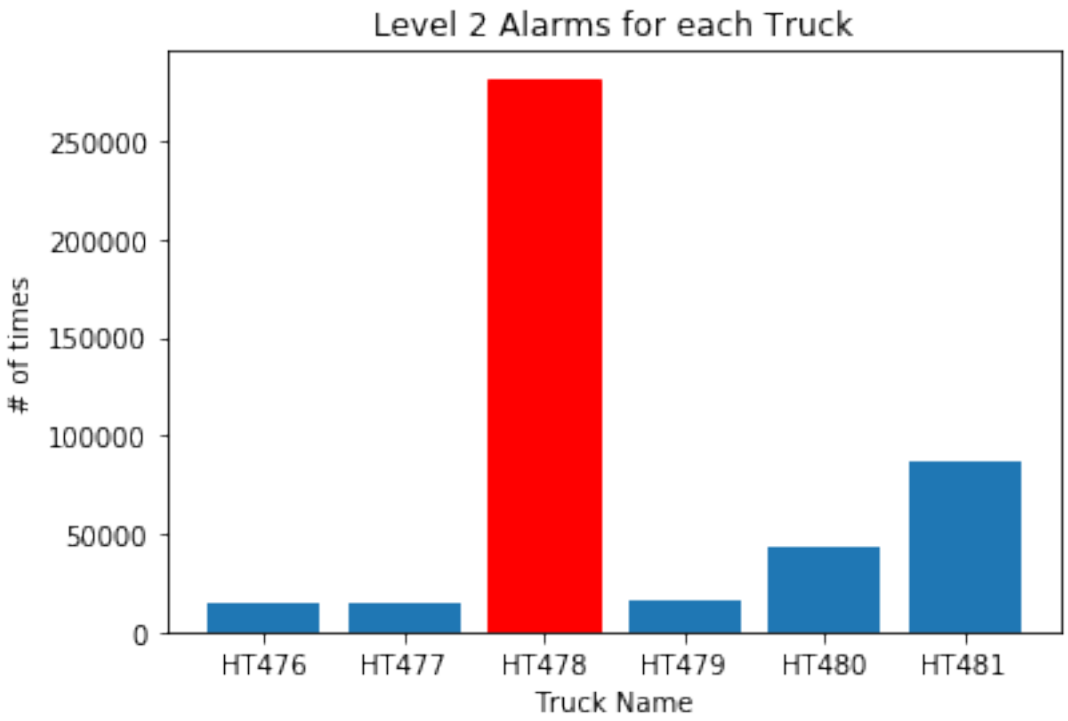


0.18 To Recap

```
In [13]: NDR = pd.read_csv('C:/Users/codyg/Desktop/BCData2018/Maintenance/NotificationDetailsRep

         equipValues = NDR['Level'] # filtering Level

         equipName = NDR['EquipmentName'] # filtering Truck Names

         myDict = set(equipName) # finding the name of Trucks

         myDictList = list(myDict) # set to list

         Truck = [0]*len(myDictList) # Truck is a list of number 1 alarms

         for i in range (len(equipValues)):
             if equipValues[i] == 1:
                 current_Truck = myDictList.index(equipName[i])
                 Truck[current_Truck] += 1

         Alarm2 = [0]*len(myDictList) # Alarm2 is a list of number 2 alarms
         for i in range (len(equipValues)):
             if equipValues[i] == 2:
                 current_Truck = myDictList.index(equipName[i])
```

```
        Alarm2[current_Truck] += 1

minCritical = Truck.index(min(Truck))
maxAlarm2 = Alarm2.index(max(Alarm2))

plt.figure(1)
barlist = plt.bar(myDictList, Truck)
barlist[minCritical].set_color('r')
plt.title('Critical Alarms for each Truck')
plt.ylabel('# of times')
plt.xlabel('Truck Name')

plt.figure(2)
barlist = plt.bar(myDictList, Alarm2)
barlist[maxAlarm2].set_color('r')
plt.title('Level 2 Alarms for each Truck')
plt.ylabel('# of times')
plt.xlabel('Truck Name')


del NDR
```





0.19 Conclusion:

0.20 Truck 478 gives us something to think about. It is either the best truck or

0.21 the worst truck depending on how we look at the data. It may also indicate

0.22 that data might not reliable and we need more accurate data to make a

0.23 conclusive observation.

1 Pressure and Temperature time series