TEAM MUGGLES

(IIT-BHU)

CASCADE CUP FINAL ROUND

(Absenteeism in a courier company)

Data Preprocessing/Feature Engineering

- **We've dropped the rows for which**:
  Reason of Absence =0
  Month of absence =0
  Day of the Week =0

- **New Features made**:
  Muscular Issues/Injuries (reasons- 12,13,19)
  Circulatory Issues (reasons - 3,6,9 + Social Drinkers (generally on verge of acquiring the circulatory diseases))
  Gastric System Issues (reasons - 4,9,11 + BMI>25(Overweight))

- **Leave status** on basis of Absenteeism Time in hours
  Absenteeism Time (0-8 hours) - Class 0 (Less than a day leave)
  Absenteeism Time (8+ hours) - Class 1 (More than a day leave)

Created some new features based on **reasons of absence**: We analyzed that some of the reasons are related to muscular, some are related to neuro, some related to gastro problems and some are just simple reasons that do not define properly what the problem was (reasons 23-28).

P.S. Reasons of absence are noted after the person takes a holiday, and hence may not count in prediction. But, they can act as important factors in analysis

Hypothesis and Assumptions

We've divided the ages into age groups namely, and we'll be using that as the basis for our analysis

(a) 25-34 Young people
(b) 34-40 Mid aged
(c) 41-60 Old aged

We've also divided the Absenteeism time into two classes wherein:

A. Class 0 represents shorter leaves with time less than 8 hours.
B. Class 1 represents longer leaves with time greater than 8 hours.

We have focused mostly on leave times and finding the reasons behind them. Differentiating on age groups, because the reasons tend to be same for a collective age group!!

Hypothesis:

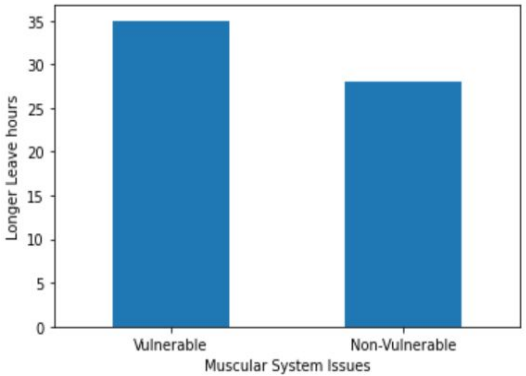
1. As age might increase, people might be more prone to diseases and might take more leaves.
2. Having children might lead to people taking more leaves.
3. Having serious issues (reasons 1-21) might lead to longer leaves as compared to other reasons like medical consultation (reasons 22-28).
4. Since this is a delivery company,there is a possibility that having a lot of weight or being overweight might be a factor that could aggravate absenteeism for longer hours.
5. Education might have a good impact on leaves (-ve correlation maybe)
6. Elderly aged employees may be less tolerant to harsh weather conditions.
7. Drinking and Smoking could be another crucial factors.

We have used median as a metric throughout the analysis, so as we get an insight on leave hours keeping aside the outliers. Not only that, we also kept an eye on the frequency of leaves taken because of certain factors.

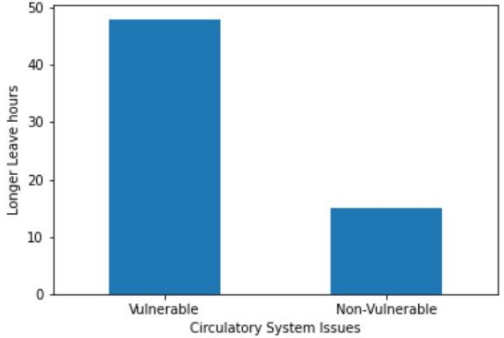
Analysis across different age groups

There are a few trends which are independent of the Age and we would like to examine those. As mentioned above, we see that features like Muscular Issues, Circulatory issues and Gastric System Issues do aggravate the median absenteeism time and also have a large share in long leaves.

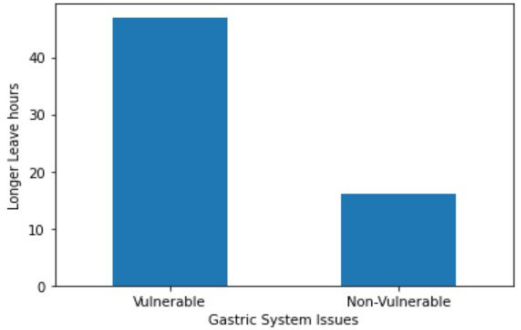
People with History of Muscular pain tend to take longer leaves, mainly more than 8 hours



Experiencing cardiac or circulatory issues causes employees to take longer leaves, mainly more than 8 hours

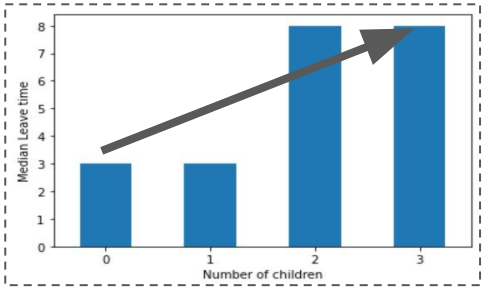


Overweight, Higher Body Mass Index and Gastric Issue are key factors where longer leaves are considered.

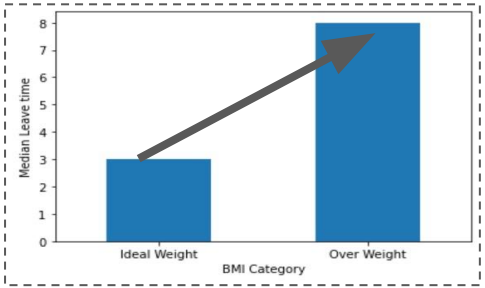


Age Group 1 analysis (Age 25-34)

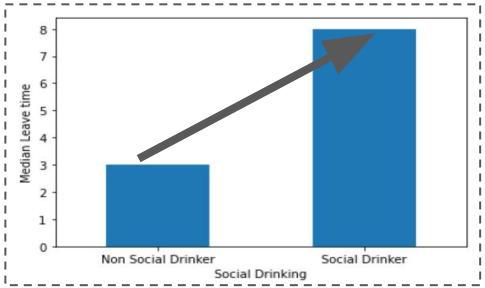
Number of Children- People with more number of children tend to take longer leaves



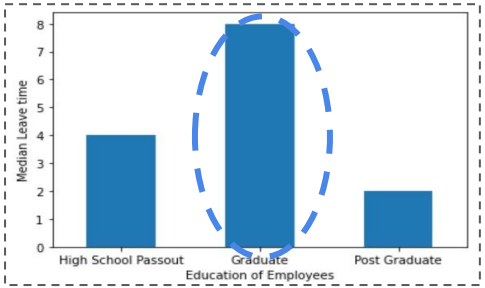
BMI- People with more weight tend to take longer leaves



Drinkers- Social Drinkers tend to take longer leaves



Education- People with Post Grad degree tend to take longer leaves. That may be:
-They want to go for further ed and are preparing for that
- They might be looking for job in different domains that might fit their qualification

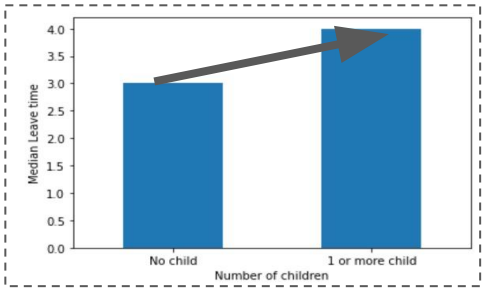


These trends validate some of our hypothesis which we mentioned in slide 2

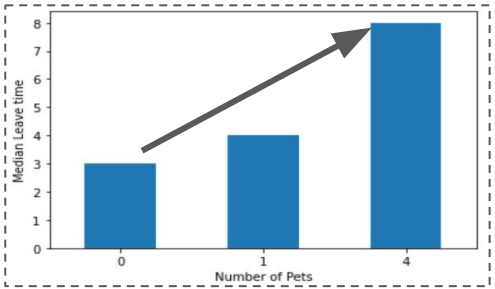
Kevin Malone
Age 28
Married
Has children
Kinda Overweight
Drinks regularly
Has Completed his post grad, but feels to go for further studies, as this might not be his dream job.

Age Group 2 analysis (Age 35-40)

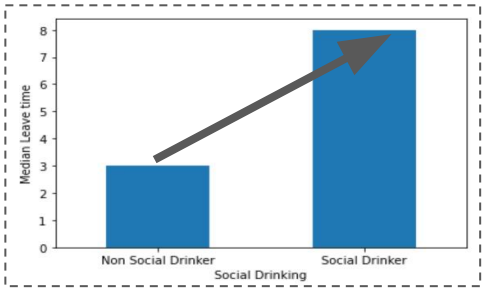
Number of Children- People with more number of children tend to take longer leaves



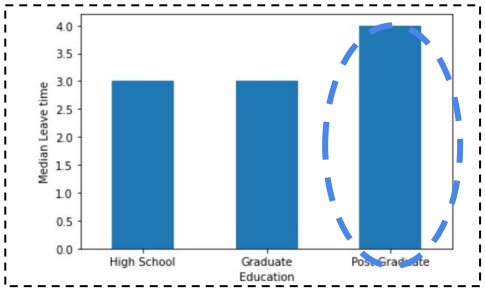
Pet- People with more number of pets tend to take longer leaves



Drinkers- Social Drinkers tend to take longer leaves



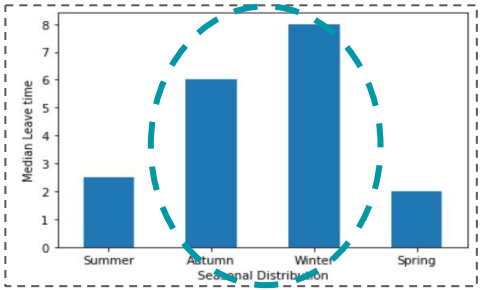
Education- People with Post Grad degree tend to take longer leaves. That may be:
- They might be looking for job in different domains that might fit their qualification



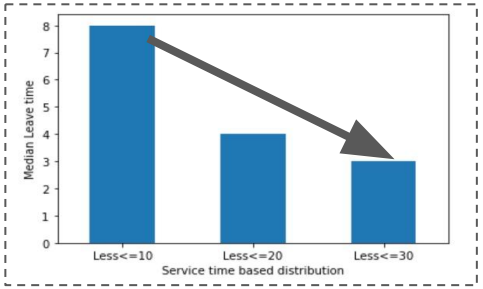
Michael Scott
Age 36
Married
Has a family and even has pets. Hence they demand some of his time and because of responsibilities, he has to take some of the days off!!

Age Group 3 analysis (Age 41+)

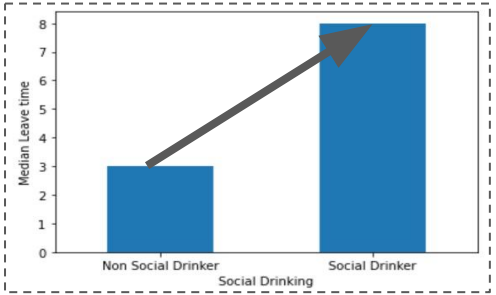
Season- Old people tend to be more conscious about the weather while taking day off.



Company Loyalty- People with greater service time are tend to be more loyal and take less hours off



Drinkers- Social Drinkers tend to take longer leaves



Education- Generally people in this category of age are not much educated and hence we cannot comment on the basis of education level.

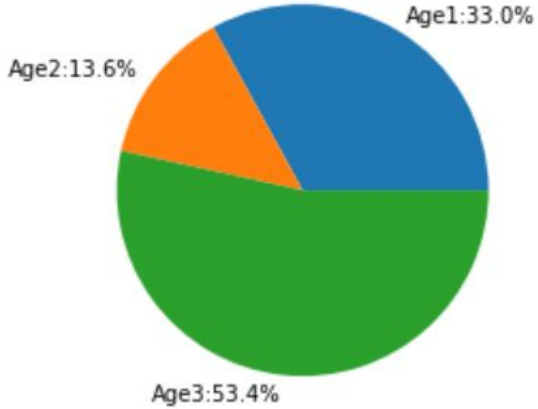
Generally people in this category tend to face more serious diseases, and hence, tend to go for longer leaves

Creed:
Age 58
Outlier to the data
Has taken some long leaves for 2 times because of nervous and muscular issues, i.e, if we look closely are age factors and lead to loss of office hours

Conclusion and Summary

The whole analysis can be summarized in the following steps:

1. Divided the dataset on the basis of age groups.
2. Focused mainly on reasons behind leave hours, and we noted that the main reasons behind the long hour leaves are because of serious reasons, and generally the reasons behind intraday leaves are not disclosed and left partially identified.
3. People from Age Category 3, take the most leaves lasting more than 40 hours.
4. Older people from Category 3, depend on a lot on the season, more vulnerable to extreme weather taking leave longer leaves in rainy and winter season.
5. Loyal employees mostly in Category 3, take shorter leaves.
6. Long term illness like Muscular, Circulatory and Gastric diseases ensure employees take longer leaves.
7. For the Age Category 1, we fmay reason that young people may look for other job options or may go for higher ed, and generally more weighted people lie in this category, and that has shown a +ve correlation with hours of absenteeism. Also, these are the new workers who took more small hours leave, that may also add to our reason of looking for other jobs (giving false reasons for leave)
8. For Age Group 2, people are more settled and have families and this may burden them with responsibilities and hence they may be late to work sometimes. Also, these people are more prone to short leaves as compared to old and young ones!!



Proportion of population taking leaves greater than 40 hours, based on age criteria.

Steps that can be taken!!

1. Retirement age should be decreased a bit since elder people taken longer hours of leave, and the work is mostly physical.
2. The company faces most absenteeism in the winters, so it will be better if the company incentivise people to work during winter hours by introducing some brownie points!
3. The company should encourage loyalty time since it means lower long absenteeism trends.
4. The company should also emphasize a healthy lifestyle for the employees, since a large number of employees are affected by Drinking and Smoking.
5. The company should organise fitness programs for employees to ensure not a lot of employees face muscular issues and take a long leave.
6. The company hire employees who manage the workload and don't ask for time for studying and pursuing another career (Since the job is a more of a blue collared job).
7. The company don't have strict disciplinary actions taken as of now. Hence, the company must take strict disciplinary actions to reduce short duration leaves, that might have false reasons.

THANK YOU

TEAM MUGGLES

Harsh Nadar

Manav Bagga