Step1 - Launching

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
dataset1=pd.read_excel(‘general_data.xlsx', sheet_name=0)
dataset1.head()
Out[41]:
 Age Attrition ... YearsSinceLastPromotion YearsWithCurrManager
0 51 No ... 0 0
1 31 Yes ... 1 4
2 32 No ... 0 3
3 38 No ... 7 5
4 32 No ... 0 4
[5 rows x 18 columns]
dataset1.columns
Out[42]:
Index(['Age', 'Attrition', 'BusinessTravel', 'Department', 'DistanceFromHome',
 'Education', 'EducationField', 'Gender', 'JobRole', 'MaritalStatus',
 'MonthlyIncome', 'NumCompaniesWorked', 'PercentSalaryHike',
 'TotalWorkingYears', 'TrainingTimesLastYear', 'YearsAtCompany',
 'YearsSinceLastPromotion', 'YearsWithCurrManager'],
 dtype='object')
```

Step 2 - Data Treatment:

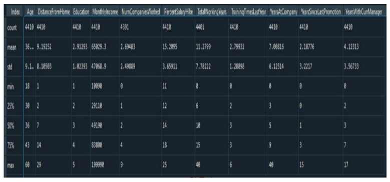
```
dataset1.isnull()
Out[47]:
 Age Attrition ... YearsSinceLastPromotion YearsWithCurrManager
0 False False ... False False
1 False False ... False False
2 False False ... False False
3 False False ... False False
4 False False ... False False
 ... ... ... ... ...
4405 False False ... False False
4406 False False ... False False
4407 False False ... False False
4408 False False ... False False
4409 False False ... False False
[4410 rows x 18 columns]
dataset1.duplicated()
Out[50]:
0 False
1 False
```

```
2 False
3 False
4 False
4405 True
4406 True
4407 True
4408 True
4409 False
Length: 4410, dtype: bool
```

```
dataset1.drop_duplicates()
Out[53]:
 Age Attrition ... YearsSinceLastPromotion YearsWithCurrManager
0 51 No ... 0 0
1 31 Yes ... 1 4
2 32 No ... 0 3
3 38 No ... 7 5
4 32 No ... 0 4
 ... ... ... ... ...
3818 28 Yes ... 0 0
3910 41 No ... 1 2
4226 36 No ... 0 0
4395 40 No ... 4 7
4409 40 No ... 3 9
[1498 rows x 18 columns]
```

Step 3 – Univariate Analysis:

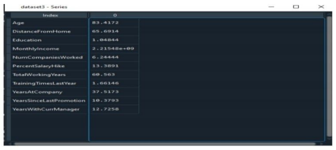
```
dataset3=dataset1[['Age','DistanceFromHome','Education','MonthlyIncome',
'NumCompaniesWorked', 'PercentSalaryHike','TotalWorkingYears', 'TrainingTimesLastYear',
'YearsAtCompany','YearsSinceLastPromotion', 'YearsWithCurrManager']].describe()
dataset3
```



Index	Age	DistanceFromHome	Education	MonthlyIncome	NumCompaniesWorked	PercentSalaryHike	TotalWorkingYears	TrainingTimesLastYear	YearsAtCompany	YearsSinceLastPromotion	YearsWithCurrManager
count	4410	4410	4410	4410	4391	4410	4401	4410	4410	4410	4410
mean	36…	9.19252	2.91293	65029.3	2.69483	15.2095	11.2799	2.79932	7.00816	2.18776	4.12313
std	9.1…	8.10503	1.02393	47068.9	2.49889	3.65911	7.78222	1.28898	6.12514	3.2217	3.56733
min	18	1	1	10090	0	11	0	0	0	0	0
25%	30	2	2	29110	1	12	6	2	3	0	2
50%	36	7	3	49190	2	14	10	3	5	1	3
75%	43	14	4	83800	4	18	15	3	9	3	7
max	60	29	5	199990	9	25	40	6	40	15	17

```
dataset3=dataset1[['Age','DistanceFromHome','Education','MonthlyIncome',
'NumCompaniesWorked', 'PercentSalaryHike','TotalWorkingYears', 'TrainingTimesLastYear',
'YearsAtCompany','YearsSinceLastPromotion', 'YearsWithCurrManager']].median()
dataset3
Out[67]:
Age 36.0
DistanceFromHome 7.0
```

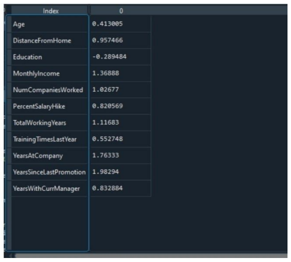
```
Education 3.0
MonthlyIncome 49190.0
NumCompaniesWorked 2.0
PercentSalaryHike 14.0
TotalWorkingYears 10.0
TrainingTimesLastYear 3.0
YearsAtCompany 5.0
YearsSinceLastPromotion 1.0
YearsWithCurrManager 3.0
dtype: float64
dataset3=dataset1[['Age','DistanceFromHome','Education','MonthlyIncome',
'NumCompaniesWorked', 'PercentSalaryHike','TotalWorkingYears', 'TrainingTimesLastYear',
'YearsAtCompany','YearsSinceLastPromotion', 'YearsWithCurrManager']].mode()
dataset3
Out[69]:
Age 35
DistanceFromHome 2
Education 3
MonthlyIncome 23420
NumCompaniesWorked 1
PercentSalaryHike 11
TotalWorkingYears 10
TrainingTimesLastYear 2
YearsAtCompany 5.0
YearsSinceLastPromotion 0
YearsWithCurrManager 2
dtype: float64
dataset3=dataset1[['Age','DistanceFromHome','Education','MonthlyIncome',
'NumCompaniesWorked', 'PercentSalaryHike','TotalWorkingYears', 'TrainingTimesLastYear',
'YearsAtCompany','YearsSinceLastPromotion', 'YearsWithCurrManager']].var()
dataset3
1
```



dataset3 - Series

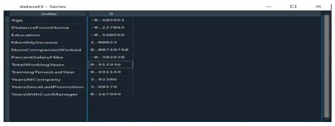
Index	0
Age	83.4172
DistanceFromHome	65.6914
Education	1.04844
MonthlyIncome	2.21548e+09
NumCompaniesWorked	6.24444
PercentSalaryHike	13.3891
TotalWorkingYears	60.563
TrainingTimesLastYear	1.66146
YearsAtCompany	37.5173
YearsSinceLastPromotion	10.3793
YearsWithCurrManager	12.7258

```
dataset3=dataset1[['Age','DistanceFromHome','Education','MonthlyIncome',
'NumCompaniesWorked', 'PercentSalaryHike','TotalWorkingYears', 'TrainingTimesLastYear',
'YearsAtCompany','YearsSinceLastPromotion', 'YearsWithCurrManager']].skew()
dataset3
```



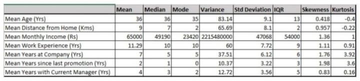
```
Index                        0
Age                          0.413005
DistanceFromHome             0.957466
Education                    -0.289484
MonthlyIncome                1.36888
NumCompaniesWorked           1.02677
PercentSalaryHike            0.820569
TotalWorkingYears            1.11683
TrainingTimesLastYear        0.552748
YearsAtCompany               1.76333
YearsSinceLastPromotion      1.98294
YearsWithCurrManager         0.832884
```

```
dataset3=dataset1[['Age','DistanceFromHome','Education','MonthlyIncome',
'NumCompaniesWorked', 'PercentSalaryHike','TotalWorkingYears', 'TrainingTimesLastYear',
'YearsAtCompany','YearsSinceLastPromotion', 'YearsWithCurrManager']].kurt()
dataset3
```



dataset3 - Series

```
Index                        0
Age                          -0.405951
DistanceFromHome             -0.227045
Education                    -0.560569
MonthlyIncome                1.00023
NumCompaniesWorked           0.00728748
PercentSalaryHike            -0.302638
TotalWorkingYears            0.912936
TrainingTimesLastYear        0.491149
YearsAtCompany               3.92386
YearsSinceLastPromotion      3.60176
YearsWithCurrManager         0.167949
```



	Mean	Median	Mode	Variance	Std Deviation	IQR	Skewness	Kurtosis
Mean Age (Yrs)	36	36	35	83.14	9.1	13	0.418	-0.4
Mean Distance from Home (Kms)	9	7	2	65.69	8.1	2	0.957	-0.22
Mean Monthly Income (Rs)	65000	49190	23420	2215480000	47068	54000	1.36	1
Mean Work Experience (Yrs)	11.29	10	10	60	7.72	9	1.11	0.91
Mean Years at Company (Yrs)	7	5	5	37.51	6.12	6	1.76	3.92
Mean Years since last promotion (Yrs)	2	1	0	10.37	3.22	3	1.98	3.6
Mean Years with Current Manager (Yrs)	4	3	2	12.72	3.56	5	0.83	0.16

Inference from the analysis:

All the above variables show positive skewness; while Age & Mean_distance_from_home are leptokurtic and all other variables are platykurtic.

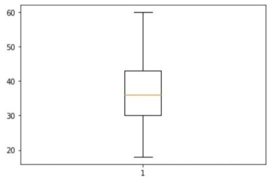
The Mean_Monthly_Income's IQR is at 54K suggesting company wide attrition across all income bands

Mean age forms a near normal distribution with 13 years of IQR

Outliers:

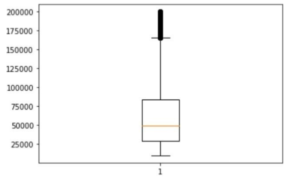
There's no regression found while plotting Age, MonthlyIncome, TotalWorkingYears, YearsAtCompany, etc., on a scatter plot

```
box_plot=dataset1.Age
plt.boxplot(box_plot)
Out[23]:
```



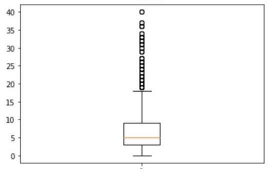
Age is normally distributed without any outliers

```
box_plot=dataset1.MonthlyIncome
plt.boxplot(box_plot)
```



Monthly Income is Right skewed with several outliers
box_plot=dataset1.YearsAtCompany

Monthly Income is Right skewed with several outliers
box_plot=dataset1.YearsAtCompany
plt.boxplot(box_plot)


40
35
30
25
20
15
10
5
0