Run all of these files. These both files are the implementation of the paper and further.

The dataset hour.csv is modified to hourout\_final.csv , such that the final dataset satisfies both out strict and not strict underreporting cases.

Main assumption:

All are cases are mutually independent of each other.

1.The **Logistic.py** file contains the code for determining the mutual information for dependent and independent variables. From the information which we obtained the dep and Indep are mutually independent of each other. The output contains plot which show at which test size(Not Strict under\_reporting) is seen in both the models comparing to sensitivity analysis.

X =Test\_size(under\_reporting)

Y =Risk\_differnce

2.The **Joint\_model.py** contains the code for the joint model for Log-likelihood and the output give a plot which gives the test size( Not strict under\_reporting) and model is compared to sensitivity analysis. At one point the point estimation which is coinciding with sensitivity analysis.

X =Test\_size(under\_reporting)

Y =Risk\_differnce

This approach is alternative to sensitivity analysis.

3. The **Strict Under reporting rate Logistic.py** file contains the code for determining the mutual information for dependent and independent variables. From the information which we obtained the dep and Independent are mutually independent of each other. The output contains plot which show at under reporting rate ( Strict under\_reporting) is seen in both the models comparing to sensitivity analysis.

X =under\_reporting\_rate

Y =Risk\_differnce

4. The **Strict Under reporting rate Joint.py** file contains the code for determining the mutual information for dependent and independent variables. From the information which we obtained the dep and Independent are mutually independent of each other. The output contains plot which show at under reporting rate ( Strict under\_reporting) is seen in both the models comparing to sensitivity analysis.

X =under\_reporting\_rate

Y =Risk\_differnce