**Machine learning**

* Handling missing values
* Drop irrelevant features (To avoid redundant)
* Feature Conversion/ Encoding

Converting non numeric to numeric

* Split dataset to X and Y
* Data Normalization (To fall within the range of 0 and 1)

1. Min max : Newvalue = (value to be converted - min value) /max –min value

=(8-6)/(14-6) =0.25

By the time you do that for each of the value, u will see that everything is between 0 to 1

1. Standardization
2. Scaler Max for normalization

* To give all features in a fair play ground, just put them in the same range. It heps in easy computation, the algorithm will compute very fast. It improves classification
* Data Split: Test and Train set
* Validation: To see the performance of the model too before final test using test set.
* After splitting, then train the model.
* Max\_iter (epoch, the number of cycles it will go per training, activation either sigmod or relu, Learning\_rate = constant function i.e. 0.01)
* Fit MLP (Multi Layer perceptron)

Training set, training label

Val\_Pred(Performance of test), Performance of training =y\_pred

* Confusion matrix can be multiple column matrix or 2by2 matrix for binary, multiple column and row for a multi-class problem. It enables us to get some parameters such as true positive, true negative, false negative, false positive.
* Acc = (tp+tn/tp+tn+fp+fn)
* PR= tp/(tp+fp)
* Recall = tp/(tp+fp)
* F1=2\*(recall\*PR)/(recall +PR)

TP: That are correctly predicted and are attack.

FP: There are normal instance, predicted as an attack.

FN: They are attack, predicted as normal.

TN: Predicted as normal instances.

(They are variables used in confusion matrix to know values that are correctly classified and those that are not correctly classifield). FP and FN (Prediction are wrong)(TP,TN)-Predictions are correct.

* Feature Selection

1. Parameter Tuning
2. Too much redundant feature
3. Underfitting
4. Overfitting
5. Minmax might not be the best for normalization.

We need a quality dataset, I stand to be corrected.

* If your label is not 0 or 1, you will need to normalize it.
* Feature Selection

1. Information Gain
2. Correlation of features