

Diabetes Classification using machine learning models

Introduction

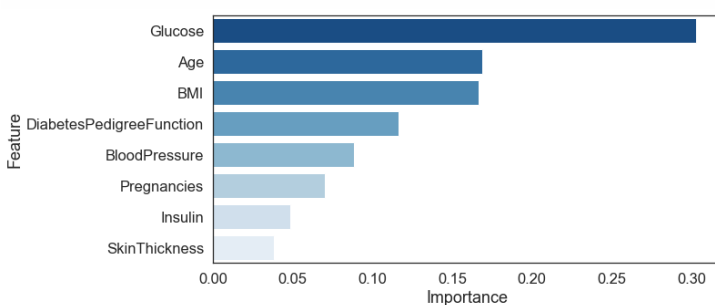
Our problem is about to diagnostically classify whether or not a patient has diabetes based on certain diagnostic measurements included in the dataset. The measurements are numerical features. They are Pregnancies, Glucose, BloodPressure, SkinThickness, Insulin, BMI, DiabetesPedigreeFunction, Age and Outcome : Class variable (0 or 1) .

This dataset is 786 records originally from the National Institute of Diabetes and Digestive and Kidney Diseases. Several constraints were placed on the selection of these instances from a larger database. All patients here are females at least 21 years old.

Methodology

We have done some data cleaning and feature engineering as removing the outliers and replacing the Nan values with suitable value.

Decision Tree was used to Know the feature Importance and then we have dropped the less important features (Insulin & SkinThickness).



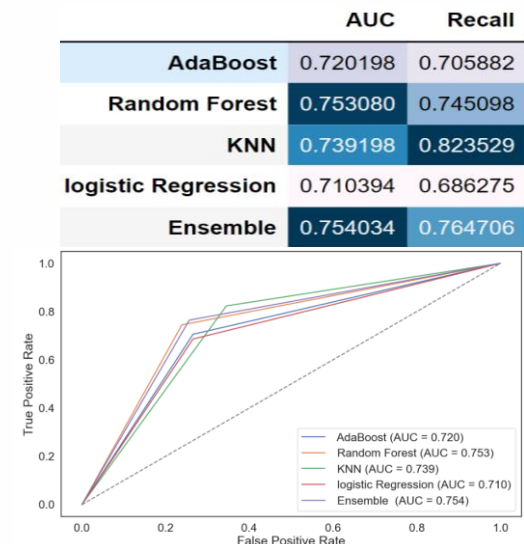
we have balanced the data because it was unbalanced. We have scaled the data and transformed the data distributions using quantile transform for linear models like KNN and Logistic Regression.

we have tried 5 Machine Learning algorithms adaBoost, RandomForest, KNN, Logistic Regression and Ensemble classifier.

We have tuned the hyperparameters of those 5 models using 5-folds Cross-validation The evaluation was done each model on the test data using classification report, confusion matrix and ROC_Curve.

Results

Those are the results that we have got after training and validating our models.

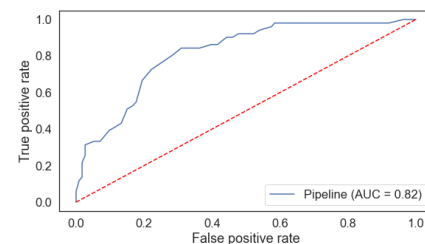
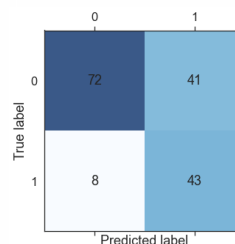


Conclusion

We can conclude that KNN algorithms is the best model among our models.

Recall: 0.823529

| | precision | recall | f1-score | support |
|--------------|-----------|--------|----------|---------|
| 0 | 0.89 | 0.65 | 0.76 | 113 |
| 1 | 0.52 | 0.82 | 0.64 | 51 |
| accuracy | | | 0.71 | 164 |
| macro avg | 0.71 | 0.74 | 0.70 | 164 |
| weighted avg | 0.78 | 0.71 | 0.72 | 164 |



Team



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