



Prof. Tristan Glatard

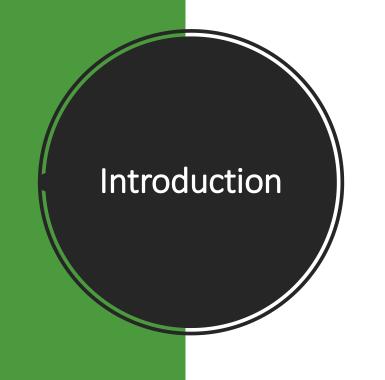
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Diabetes Readmission Prediction for Patients



Readmission: a patient who had been discharged from a hospital is **admitted again** within a specified time interval

Related to the safety of patient's health and live

Related to more use of hospital service and cost

Data science can help to solve the problem

Identify the patients who are at risk for readmission

Reduce readmission rate of patients



A 10 years of clinical care diabetic dataset

Supervised learning

Target classes: readmit <30 days, readmit >30 days and never readmit

Samples: 101766, Features: 50

Features Type: Numerical and Categorical



Identifiers: encounter_id and patient_nbr

Missing Values > 35 %: weight (97%), payer code (40%), and medical specialty (47%)

Constant value: examide, citoglipton and glimepiride-pioglitazone

Multiple inpatient visits

Patients who expired

Patients who discharge to a hospice

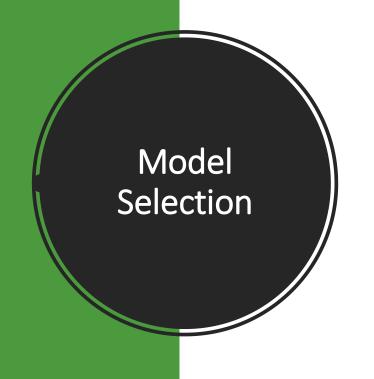


Label encoding for categorical features

Binning samples

Data scaling

Data resampling



Logistic Regression and Random Forest Classifiers

Python, scikit-learn, pandas

Data splitting: training: test = 70:30

Model parameters are selected using k-fold cross validation

Accuracy matric: accuracy, precision, recall, F1

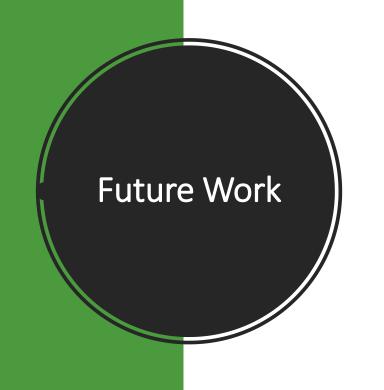


Without resampling

Matric	Logistic Regression		Random Forest	
	Training	Test	Training	Test
accuracy score	0.602	0.600	0.852	0.609
precision score	0.602	0.600	0.852	0.609
recall score	0.545	0.546	0.880	0.574
f1_score	0.572	0.572	0.866	0.591

With resampling

Matric	Logistic Regression		Random Forest	
	Training	Test	Training	Test
accuracy score	0.430	0.430	0.965	0.815
precision score	0.430	0.430	0.965	0.815
recall score	0.425	0.425	0.966	0.815
f1_score	0.427	0.428	0.965	0.815



Cluster-computing and Parallel-computing Framework: Apache, Dask

More accurate model like Neural Network

