



## PREDICTING PATIENT RE-ADMISSION WITHIN 30 DAYS



### THE CLIENT

The client is a leading provider of comprehensive health informatics solutions for more than 900+ hospitals in the US.



### BUSINESS NEED

The customer wanted AL TEN Calsoft Labs to identify a patient's chance of getting re-admitted upon discharge within 30 days.



### SOLUTION DELIVERED

AL TEN Calsoft Labs' Big Data Analytics team did the following to come up with a predictive analytics solution.

#### 🕒 Identify the Predictors

- Demographics – Age, Sex
- Lab data – Includes lab tests
- Vitals – Includes BP, Sugar, Weight
- Visit types – Emergency, In-patient, outpatient
- Diagnosis & Diseases/ ailments – Heart, Pneumonia
- Previous hospital visit
- Length of stay

#### 🕒 Build/Evaluate the Model

- Model is maintained dynamically
- Split the data into
  - Training set
  - Test set
- Build the model on training set
  - Model is serialized
  - ready for new datasets

#### 🕒 Process the Dataset

- Date fields – Validate the date
- Calculate the 30 days stay
- Refine the dataset for building Model/Analysis

#### 🕒 Identify the Suitable Algorithm

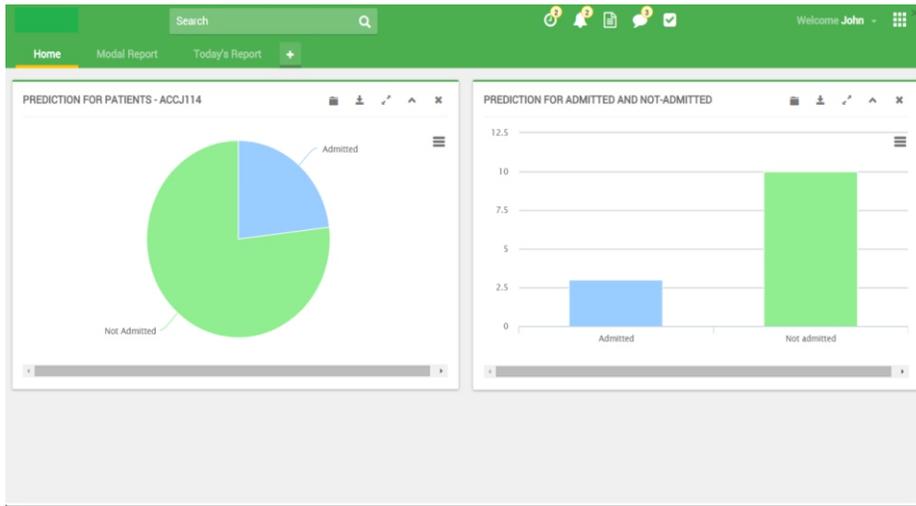
- Gradient Boosting
- Random Forest
- Support Vector Machines
- Logistic Regression
- K-Nearest Neighbour
- Ridge

#### 🕒 Data for new evaluation

- New data sets are analysed
- Available in .CSV

#### 🕒 Data Visualization

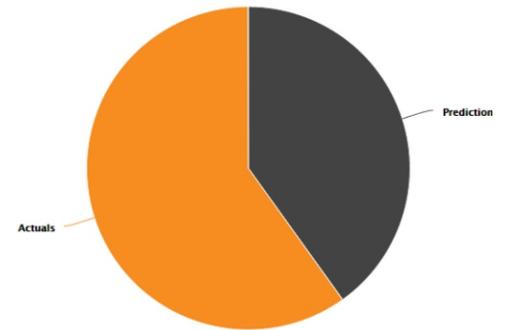
- .csv is converted into JSON format
- Displayed using Alten Calsoft UI framework



Details:

Algorithm: Random Forest  
Score: 0.77

Patient Re-admissions within 30 days:



ACLPatientID	Patient_Name	Age	Sex	Predictions
ACL000013503	JOHN BADLEY	72	M	Y
ACL000013156	STACY COLLINS	73	F	Y
ACL000011568	MICHAEL ARCHER	81	M	Y



### TECHNOLOGY USED

- **Business Platform:** Hadoop - Hortonworks
- **Paradigm:** Hive, MapReduce
- **Machine Learning Tools:** Scikit-Learn, R
- **Language:** Python, R



### BUSINESS BENEFITS

Clinicians can be prepared to provide better post-discharge care for patients who are likely to get re-admitted.

### ABOUT ALTEN CALSOFT LABS

ALTEN Calsoft Labs is a next gen digital transformation, enterprise IT and product engineering services provider. The company enables clients innovate, integrate, and transform their business by leveraging disruptive technologies like mobility, big data, analytics, cloud, IoT and software-defined networking (SDN/NFV). ALTEN Calsoft Labs provides concept to market offerings for industry verticals like education, healthcare, networking & telecom, hi-tech, ISV and retail. Headquartered in Bangalore, India, the company has offices in US, Europe and Singapore. ALTEN Calsoft Labs is a part of ALTEN group, a leader in technology consulting and engineering services.

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