Readmission Prediction of Diabetic Patients

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INTRODUCTION

- Diabetes affect more than **10%** of U.S. Population as of 2020
    - Type II diabetes account for over 90%
- 7.8 million hospital discharges of adults in U.S. had **diabetes** in their diagnosis in 2016
- 16 million **emergency visits** in 2016 had diabetes as a list of diagnosis
    - Over 10% of total emergency visits in U.S. in 2016
- Diabetes directly and indirectly contributed to over **350,000 death** in 2017

Source - CDC, diabetesresearch.org, acepnow.com

DATA

130 Hospitals

Over 50 Features

102,000 Patients

Predictant: No readmission, <30 days, and >30 days

METHODS

Data Acquisition

Downloaded from Kaggle based on VCU research

Data Prep

Cleaned missing data

Recategorized features

EDA

Visualization

Statistical Test

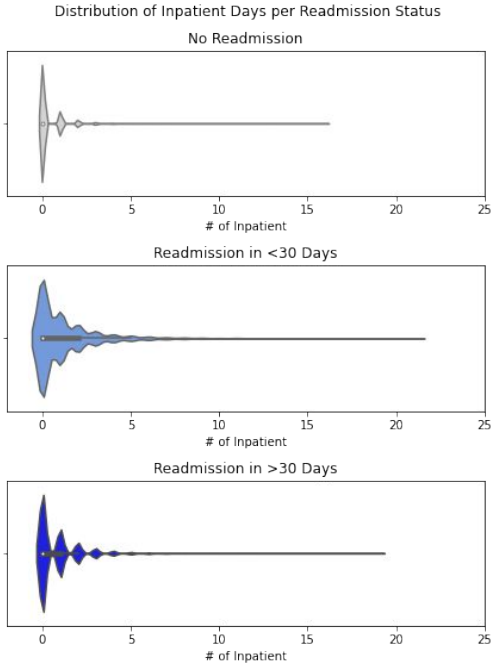
Models: Decision Tree, Random Forest

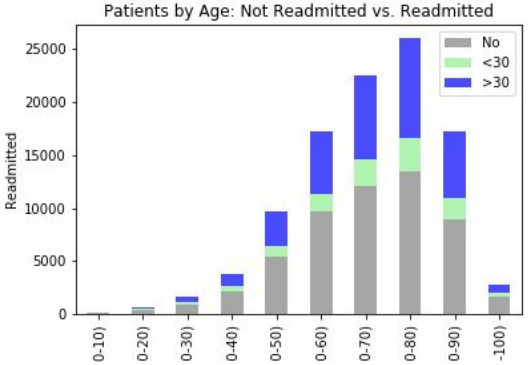
Metric: Recall, “micro” averaging

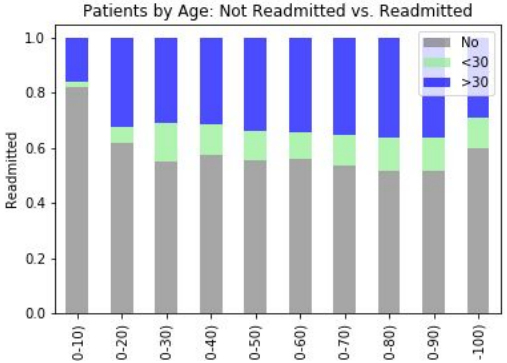
Hypertune: Grid Search Cross Validation

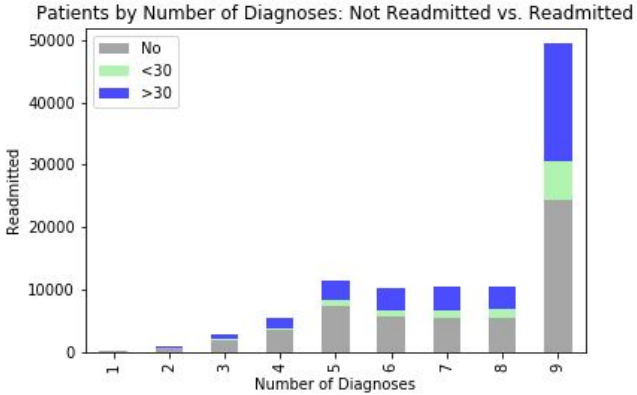
Score: Random Forest: **0.942**

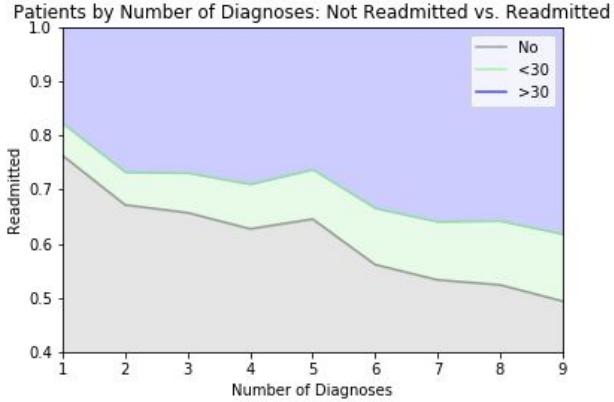
MODELING - Features



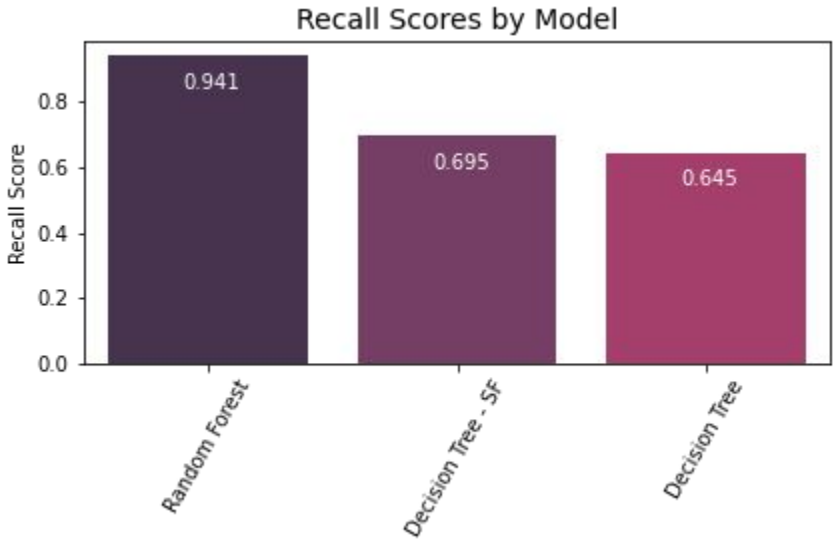


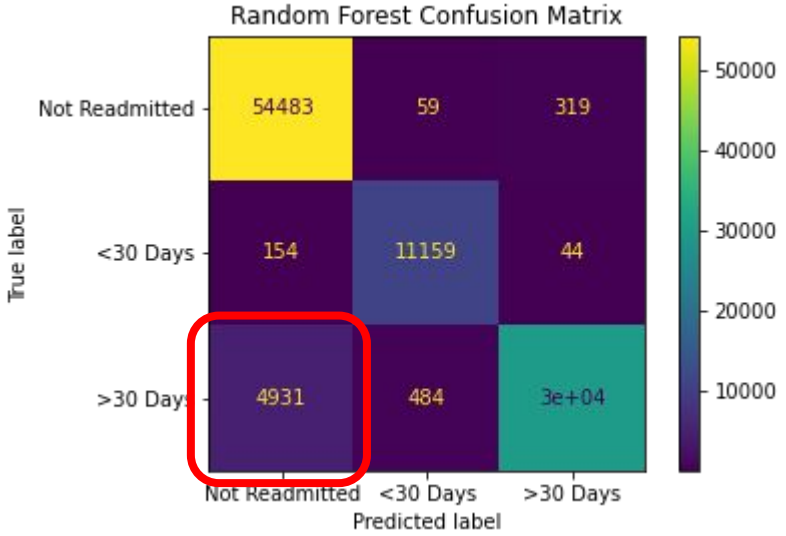




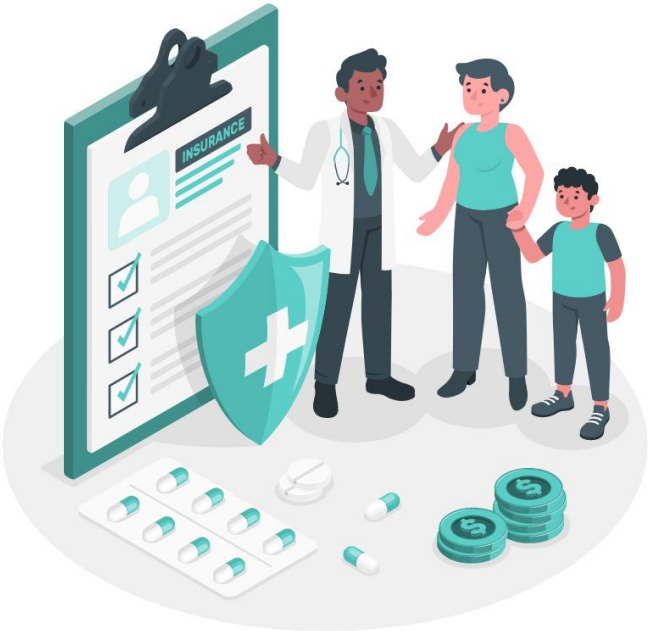


MODELING - Performance





Conclusions



- Health Care Providers can **plan future treatments** based on model output.
- Patients with expected readmission greater than 30 days can plan for **future check-ups.**
- Patients with expected readmission within 30 days can receive more **focused treatment**.
- Health Care Providers can plan for potential overcrowding and **resource allocation**.

Future Steps

- Check for new treatment method for **additional features.**
- Predict on recent data to see **change in** treatment or patient **trends**.
- Check for **diabetes types** to check for difference in feature importance.

Thank You

Questions?

Project Repo