

Project Summary

Batch details	PGPDSE-FT-O-APR'23
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Domain of Project	Healthcare Analytics
Proposed project title	Identifying Critical Patients Prediction Model.
Group Number	1
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Date: 8th-October-2023

Signature of the Mentor

Signature of the
Team Leader

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Project Details:

OVERVIEW :

We have dataset for the hospitals around the U.S. Our aim here is to study the dataset and try to build a prediction model which would be able to predict the condition of the patients for all kinds of causes. We would be using an appropriate algorithm which gives us a good prediction model. With this prediction model we could identify patients in critical conditions who require special attention from the Doctors.

Business problem statement (GOALS):

1. Business Problem Understanding

- The Patient Survival Prediction dataset aims to develop and validate a prediction model among admitted patients to identify critical patients.
- The dataset is well-documented and contains information about admitted patients. It can be used for various purposes such as learning, research, and application.
- The dataset provides valuable insights into predicting patient's condition based on factors recorded during hospitalization. By analyzing this data, We can understand where special attention is needed.

2. Business Objective

- The main objective of this dataset is to improve patient outcomes by predicting patient condition order to identify patients who require special attention based on factors recorded during hospitalization.
- The specific business objective for this dataset could be to develop a predictive model that accurately identify patients at high risk. This model could be used by healthcare providers to proactively allocate resources, prioritize treatments, and improve patient outcomes.
- Additionally, it could help identify potential areas for quality improvement within hospitals and guide clinical decision-making processes.

3. Approach :

Prediction models typically involve preprocessing the dataset, selecting relevant features, splitting the data into training and testing sets, training the prediction model on the training set, and evaluating its performance on the testing set.

The goal is to develop a model that accurately predicts patient condition based on the available predictors recorded during hospitalization so that more timely and specific attention can be given to them.

4. Conclusions :

The Patient Survival Prediction Dataset provides a valuable resource for researchers and healthcare professionals interested in understanding the factors that influence patients condition. Its diverse set of features offers opportunities for predictive modeling and decision support in the medical field.

TOPIC SURVEY IN BRIEF :

Problem understanding:

We are supposed to build a prediction model which will be able to predict critical patients admitted in the hospital for all kinds of causes for eg physical trauma or injury or comorbidities or diseases.

We have data set which have recorded all medical parameters from patients from each encounter. It has around eighty-five columns and around ninety-thousand records.

COLUMN DESCRIPTION:

- Records of whether patient was admitted for elective surgery.
- Unique identifying columns like patient_id, hospital_id, etc.
- Location of the patient prior to being admitted .
- ICU coding systems given to patients based on their severity.
Eg Apache II, Apache IIIJ, GCS.
- Apache 4 Probability predictions of death rate according to the apache scores .
- Other medical parameters like Blood pressure and Heartrate, temperature.
- Whether patient suffers from diseases and co morbidities.

Current solution to the problem:

Consult with healthcare professionals, domain experts to understand patients needs and expectations .Based on the critical factors they believe influence patient's condition is used in the prediction.

Proposed solution to the problem:

Perform EDA and understand the dataset. Identify the key features that influence the

Patients condition in a hospital. Build predictive models using algorithms that help in classification of patients into those who need special attention.

Reference to the problem:

<https://www.kaggle.com/code/mitishaagarwal/patient-survival-prediction-deep-learning>

CRITICAL ASSESSMENT OF TOPIC SURVEY :

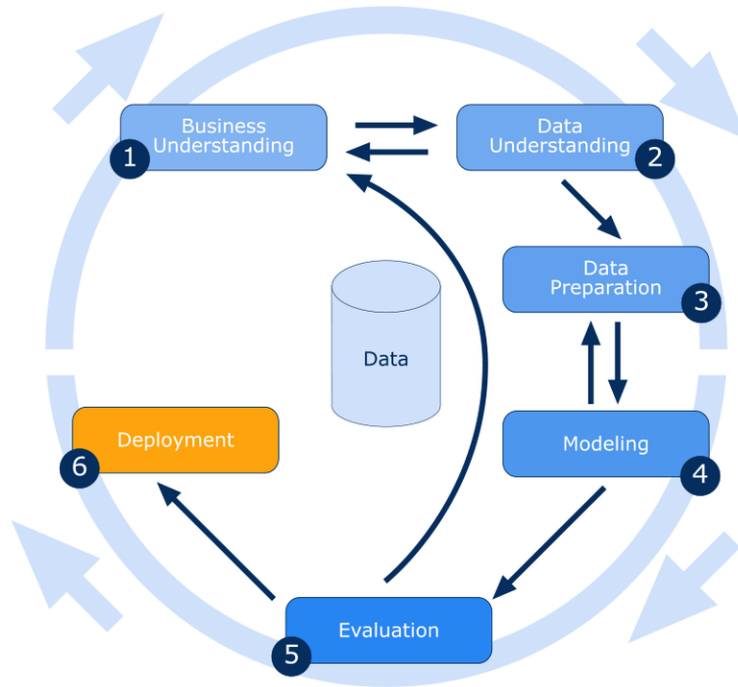
1. Find the key area, gaps identified in the topic survey where the project can add value to the customers and business

In the critical assessment of the topic survey on patients' survival prediction, it is crucial to identify the key areas and gaps where the project can add value to both the patients and the healthcare business. This involves analyzing the survey results and identifying areas where the prediction model can be improved to provide more accurate and reliable predictions, ultimately benefiting the patients and helping healthcare providers make informed decisions.

2. What key gaps are you trying to solve ?

The key gaps that we are trying to solve in the patients' survival prediction project are related to improving the accuracy and reliability of the prediction model. By addressing these gaps, we aim to enhance the effectiveness of the model in predicting critical patients, which can have a significant impact on their treatment plans and overall healthcare management.

METHODOLOGY TO BE FOLLOWED:



1. Business Understanding:

Understand the medical parameters which influence the condition of the patients for all kinds of causes in a hospital to help doctors to give appropriate guidance to the patients. In summary, patient survival prediction datasets have broad applications in healthcare, from improving patient care and outcomes to optimizing resource allocation and informing medical research and policy decisions.

2 . Data Understanding:

The data has all the parameters about the patient from the point of admission into the hospital , going through all the procedures in ICU and unit cell to the point where he/she gets discharged.

It includes unique identifiers, ICU severity scores (APACHE and GCS), Other medical parameters of the patient(blood pressure, and heart rate), Probabilistic death rate based on apache III scores, whether patient has other comorbidities (leukemia, AIDS etc).

3. Data Preparation:

We perform exploratory data analysis, and remove null values, look for outliers, perform univariate and bivariate analysis to find relations among the parameters. We standardize and transform our data features..

4. Modeling :

We are going to build a Classification model based on the Dataset.

5. Evaluation :

We are building a classification model and we may use auc gini, roc, f1 scores etc to evaluate the model's performance.

6. Deployment:

After we build a model we may use the model in Business environment.

REFERENCES :

The references can be blogs, articles or even social media news relevant to explain the importance of the projects.

“Statistical Methods for Survival Data Analysis” by Elisa T. Lee and John Wang

“Dynamic Prediction in Clinical Survival Analysis” by Hein Putter and Tom van Houwelingen

“Handbook of Survival Analysis” edited by John P. Klein and Hans C. van Houwelingen

Notes For Project Team

Sample Reference for Datasets (to be filled by team and mentor)

Original owner of data	Mitisha Agarwal
Data set information	Patient-Survival Prediction
Any past relevant articles using the dataset	None
Reference	None
Link to web page	https://www.kaggle.com/code/mitishaaagarwal/patient-survival-prediction-deep-learning
