SE301

Special Topics in Software Engineering

Heart Failure Prediction Report

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Introduction

Because of complications like heart attacks and strokes, cardiovascular diseases (CVDs) remain one of the multiple leading causes of death. Thus, improving patient results now requires prevention and early detection by examining trend in patient health data. As a consequence of the need to examine trends machine learning has been shown to be an effective method to help identify cardiac issues. A great chance to investigate this possibility using predictive modeling is presented by Fedesoriano's (2022) heart failure prediction dataset on Kaggle.

Dataset Overview

The *"heart.csv"* dataset is specifically designed for the development of machine learning models that have the ability to predict heart diseases based on user input for various features or attributes. It covers a wide selection of patient related information taken from other datasets, which makes this data unique and demonstrative.

The dataset includes medical features that are associated with cardiovascular risk. These include a patient's age and gender, as well as many types of chest pain, which is categorized into four types: typical angina (TA), atypical angina (ATA), non-anginal pain (NAP), and asymptomatic (ASY). These categories help in identifying the existence and nature of chest related symptoms, which may be early pointers to heart problems.

Other features include resting blood pressure and cholesterol levels, two essential indications in cardiovascular health calculations. Fasting blood sugar levels are also included, as raised up glucose levels can contribute to major damage over time. Resting electrocardiogram results provide awareness into the electrical

activity of the heart and also have categories, which are normal, ST-T wave abnormalities (ST), or left ventricular hypertrophy (LHV) that can possibly result in physical heart issues.

The dataset also keeps track of the maximum heart rate achieved during physical activity and checks if exercises introduce chest pain. It includes an old peak value that measures the ST segment depression during exercise. The slope of the ST segment is either upward, flat, or downward.

Conclusion

The heart failure prediction dataset by Fedesoriano (2022) is an excellent and thoughtfully gathered dataset that enables the implementation of machine learning models to the medical field. By including varied medical attributes from multiple datasets, it provides an outstanding foundation for training models that can promote predicting heart disease and failure. With proper preprocessing and cleaning of 0 values in the cholesterol section for example, this dataset can lead to meaningful predictions and practical applications in the field of cardiovascular care.

Reference List:

- Fedesoriano (2022) Heart Failure Prediction. *Kaggle*. Available at: https://www.kaggle.com/datasets/fedesoriano/heart-failure-prediction (Accessed: 11 June 2025).