Data Mining and Decision Tree Analysis for Diabetes Prediction: An Exploration of Preprocessing, EDA, and Classification Models

Student Number: 100611584

Module: Data Mining and Foundations of AI

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# Introduction

## Project Overview

This project aims to predict whether a person had diabetes using machine learning algorithms. Diabetes is a chronic disease that affects millions globally and early prediction is crucial for effective management. Predictive models can help healthcare professionals identify high-risk individuals and take preventive actions

## Dataset Description

The dataset used for this project is the “Healthcare Diabetes Dataset” available on Kaggle. It contains data from a variety of health-related features, including age, BMI, blood pressure, glucose levels and more. The target variable is binary which indicates whether an individual had diabetes (1) or not (0).

## Problem definition and objective

The main goal and problem definition is to predict the likelihood of diabetes based on a patient’s health metrics. By building a predictive model we can achieve this and evaluate different machine learning algorithms in order to select the best-performing model for accurate predictions

# Exploratory Data Analysis

## Data Summary and Initial Observations

## Visualization Techniques (e.g., Histograms, Scatter Plots)

## Correlation Analysis

# Data Preprocessing

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## Encoding Categorical Variables

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# Model Selection and Implementation

## Logistic Regression

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## Confusion Matrix and Classification Report

## Cross-Validation Results

## Comparison with Other Models

Discussion

## Key Insights from the Analysis

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## Summary of Findings

## Future Work and Improvements

# References

There are no sources in the current document.