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**Abstract**

Diabetes is a prevalent health concern, impacting numerous lives each year. Early detection and effective management can greatly enhance outcomes and potentially save lives. This report seeks to offer a clear and succinct overview of diabetes prediction methods. We will delve into various techniques and computer models employed for predicting the risk of diabetes, elucidating their mechanisms, and presenting crucial findings in an accessible table.

**Introduction**

Diabetes, a prevalent and impactful health condition globally, demands proactive management. Early identification of risks is crucial to implement preventive measures and mitigate its potentially severe consequences. This report explores the prognostic capabilities related to diabetes, underscoring the importance of early detection and intervention. By conducting a thorough review of current research and models, this paper aims to elucidate effective methods for predicting and, ultimately, addressing diabetes, with the goal of enhancing individual and public health outcomes.

**Literature Survey**

A variety of methods have been employed to predict diabetes, utilizing approaches ranging from machine learning to statistical analyses and combinations of these techniques. Research studies have investigated factors such as age, cholesterol levels, blood pressure, and lifestyle to determine the risk of developing diabetes. Models developed for diabetes prediction leverage these variables to make informed assessments, aiming to identify individuals at risk and facilitate proactive intervention strategies.

**Models**

Various approaches can assist in predicting the likelihood of someone developing diabetes. Computer models, including "logistic regression," "support vector machines," and "decision trees," play a crucial role in this predictive process. These models analyze diverse patient information, such as age, weight, blood pressure, and lifestyle habits, to estimate the risk of diabetes onset over a specific period. By utilizing these predictive models, healthcare professionals and individuals can proactively take early measures, such as adopting healthier habits or initiating appropriate treatments, to manage and potentially prevent the onset of diabetes.

**Methodology**

Predicting diabetes involves a systematic process. Initially, healthcare professionals collect crucial information about patients, including details such as age, weight, blood pressure, and lifestyle habits. Subsequently, they ensure the accuracy of this gathered information. Following that, specialized computer programs are employed to "train" a model, enabling it to identify patterns and make predictions regarding diabetes risk. Finally, the model undergoes testing with new information to assess its efficacy in predicting the likelihood of diabetes development.

**Results:**

|  |  |
| --- | --- |
| **Model** | **Accuracy** |
| Logistic regression | 75.32 |
| KNeighbourClassifer | 68.18 |
| SVC | 78.57 |
| Decision Tree | 69.48 |
| Random Forest | 74.02 |

These results demonstrate the effectiveness of different models in predicting diabetes, underscoring their accuracy in delivering dependable predictions.