**Introduction**

Gestational diabetes mellitus (GDM) is a type of diabetes that develops during pregnancy in women who did not have diabetes before becoming pregnant. It typically arises in the middle of pregnancy, usually between 24 and 28 weeks gestation. Despite often presenting without symptoms, GDM poses significant health risks for both mother and baby. Notably, it significantly increases the mother's risk of developing type 2 diabetes later in life, and it can lead to complications such as larger babies, early delivery, and low blood sugar in newborns. Detecting GDM early is crucial for effective management and prevention of adverse outcomes. To enhance early detection of GDM, this project leverages machine learning techniques, specifically the Support Vector Machine (SVM) algorithm. SVM is a powerful tool for classification tasks, making it ideal for predicting the likelihood of gestational diabetes based on various parameters such as maternal demographics, medical history, and clinical measurements. The project utilizes a dataset sourced from kaggle, containing comprehensive records of pregnant women, including those diagnosed with GDM. Through extensive preprocessing steps, the dataset is prepared for training the SVM model. This involves cleaning the data, handling missing values, and normalizing features to ensure optimal performance of the algorithm. Once the SVM model is trained, it undergoes rigorous evaluation to assess its accuracy in predicting GDM. Performance metrics such as accuracy, precision, recall, and F1-score are computed to gauge the effectiveness of the model. By fine-tuning the SVM parameters and optimizing the feature selection process, the goal is to develop a robust predictive model capable of accurately identifying women at risk of gestational diabetes. To illustrate the real-world application of the project, consider the case history of a 31-year-old woman presented in this introduction. Despite having no prior history of diabetes, her family's medical background raised concerns about her predisposition to GDM. Through the utilization of SVM algorithm on her clinical data, including blood pressure, BMI, and glucose levels, her risk of developing GDM was accurately assessed. This case exemplifies the importance of early detection and personalized management in mitigating the adverse effects of gestational diabetes on both maternal and fetal health.

In summary, this project aims to contribute to the advancement of GDM detection by harnessing the capabilities of machine learning algorithms. Through the integration of SVM and comprehensive clinical data, we endeavor to provide healthcare professionals with a valuable tool for early identification and intervention, ultimately improving outcomes for pregnant women and their babies.