**Diabetes Prediction Analysis Assignment**

# **Objective:**

The objective of this analysis is to explore and visualize the key factors contributing to diabetes among patients using a comprehensive dataset. By leveraging Power BI, we aim to identify patterns, correlations, and trends within various medical predictor variables such as glucose levels, BMI, insulin levels, age, and others. The goal is to create an interactive and insightful diabetes prediction analysis dashboard that can aid healthcare professionals in understanding the prevalence and risk factors associated with diabetes, ultimately informing more effective prevention and treatment strategies.

## **Dataset Description:**

The dataset consists of several medical predictor variables and one target Outcome, variable, predictor variables include the number of pregnancies the patient has had, their BMI, insulin level, age, and so on.

**Pregnancies**: Number of times pregnant

**Glucose**: Plasma glucose concentration 2 hours in an oral glucose tolerance test

**BloodPressure**: Diastolic blood pressure (mm Hg)

**SkinThickness**: Triceps skin fold thickness (mm)

**Insulin**: 2-Hour serum insulin (mu U/ml)

**BMI**: Body mass index (weight in kg/ (height in m) ^2)

**DiabetesPedigreeFunction**: Diabetes pedigree function

**Age**: Age (years)

**Outcome**: Class variable (0 or 1) 268 of 768 is 1, the others are 0

**Key Insights from Dashboard**

**Diabetes by Pregnancies:**

* 5.96% of diabetic patients have had multiple pregnancies compared to 94.04% of non-diabetic patients, indicating a possible correlation between pregnancy count and diabetes prevalence.

**Diabetes by Age Group:**

* A line chart depicts the number of diabetic patients across different age groups.
* The highest number of diabetic patients falls within the 20-29 age group, with 84 patients, decreasing with older age groups.

**Blood Pressure and Glucose by Age Group:**

* A clustered bar chart compares blood pressure and glucose levels across age groups.
* Younger patients (20-29) have significantly higher glucose levels, while blood pressure is relatively consistent across all age groups.

**Diabetes by Skin Thickness:**

* A scatter plot shows the relationship between skin thickness and diabetes.
* Higher skin thickness values are associated with a higher number of diabetic patients.

**Insulin Count by Insulin Group:**

* A pie chart categorizes insulin levels into four groups: Low, Normal, High, and Very High.
* The majority (53.91%) of patients fall into the 'Very High' insulin group, followed by 'Normal' (20.57%), 'High' (14.45%), and 'Low' (11.08%).

**Diabetes Pedigree Function by BMI:**

* A line chart illustrates the relationship between diabetes pedigree function and BMI.
* Higher BMI values generally correlate with higher diabetes pedigree function, suggesting a stronger genetic predisposition for diabetes among patients with higher BMI.

**Average of Glucose and Diabetics by BMI:**

* A vertical bar chart shows the average glucose levels concerning BMI, highlighting the distribution of diabetic patients.
* A goal indicator suggests that an average glucose level of 129.00 is significantly higher than the target, indicating a need for better glucose management among the population.

**Recommendations**

1. Focus on Young Adults: With a high number of diabetic patients in the 20-29 age group, targeted interventions and educational programs for younger adults may help in early detection and prevention.
2. Manage Insulin Levels: With more than half of the patients falling into the 'Very High' insulin group, there is a need for closer monitoring and management of insulin levels to prevent complications.
3. Promote Healthy BMI: As a higher BMI is correlated with higher diabetes pedigree function, promoting healthy weight management strategies could help in reducing diabetes risk.
4. Pregnancy and Diabetes: Given the possible correlation between the number of pregnancies and diabetes, there is a need for targeted support and monitoring for women who have had multiple pregnancies.

**Summary**

Total Patients: The dataset consists of 768 patients.

Diabetes Patients: Out of the total, 268 patients (34.9%) have been diagnosed with diabetes.

Average BP: The average blood pressure (BP) among all patients is 69.11 mm Hg.

Average BMI: The average Body Mass Index (BMI) across the dataset is 31.99.

Average Age: The average age of the patients is 33.24 years.