Solving Health Challenges with AI — A Machine Learning Model for Diabetes Detection

# SDG 3: Good Health and Well-being

# The Problem

Chronic diseases like diabetes silently affect millions around the world. According to the World Health Organization, over 400 million people are currently living with diabetes, many without knowing it. The challenge is simple but serious: early detection is rare, especially in low-resource areas where diagnostic infrastructure is lacking.

This aligns with UN Sustainable Development Goal 3 (SDG 3), which calls for ensuring healthy lives and promoting well-being for all at all ages. One specific SDG target “reduce premature mortality from non-communicable diseases through prevention and treatment” inspired my project.

# The Project: Predicting Diabetes with Machine Learning

My project introduces a machine learning model that can predict whether a person is likely to have diabetes based on common diagnostic health indicators like glucose levels, BMI, blood pressure, and more.

## Dataset

- Source: Plotly Diabetes Dataset

- 768 records with 8 features

- Label: 0 (No diabetes) or 1 (Diabetes)

## ML Model

- Model Used: Random Forest Classifier

- Type: Supervised Learning

- Tools: Python, Pandas, Seaborn, Scikit-learn

- Accuracy: ~85%

The model goes through the standard machine learning pipeline

1. Data Cleaning and Visualization

2. Feature Analysis

3. Model Training and Evaluation (Confusion Matrix, F1-score)

4. Feature Importance Detection

# How This Project Supports SDG 3

This solution contributes directly to early disease detection, helping reduce the burden on healthcare systems by:

- Identifying at-risk individuals before symptoms develop

- Empowering community health workers with lightweight digital tools

- Supporting scalable screening in underdeveloped regions

# Ethical Reflection

- Fairness: The model doesn't replace doctors it supports them

- Bias: The dataset may not reflect global diversity, so further data would be needed for real-world deployment

- Sustainability: Prevention is less costly than treatment; tech like this helps bridge access gaps in global healthcare

# Final Thoughts

Technology can and should be a force for good. This project proves that AI can save lives not just optimize ads or recommend songs. By aligning with SDG 3, my diabetes prediction model shows how a simple machine learning application can make a real-world difference.