

Diabe-Detect

A ML ANALYSIS ON DIAGNOSING DIABETES

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In 2021, 11.6% of the U.S.
population, or 38.4 million
people, had diabetes.¹

WHAT IS DIABETES?

Diabetes is a **chronic condition** that occurs when the body doesn't produce enough insulin or can't use insulin properly. Insulin is a hormone that helps regulate blood sugar levels.²



THE OBJECTIVE:

IDENTIFY PREDICTORS OF DIABETES

The object was to develop machine learning models to predict the risk of developing diabetes based on **symptoms, health habits, SDOH, and other clinical indicators**. These models will help healthcare professionals and individuals identify at-risk populations and take preventive steps, improving diabetes prevention, early detection, and management.



What factors are strong predictors of diabetes?

Symptoms

- Polyuria
- Polydipsia
- Visual blurring
- Partial Paresis
- Delayed healing

Lifestyle and Health Habits

- Alcohol
- Physical Activity
- Sleeping
- Smoking
- Med CheckUps

Health Indicators/SDOH

- Age
- BMI
- Location
- BG Level
- HbA1C

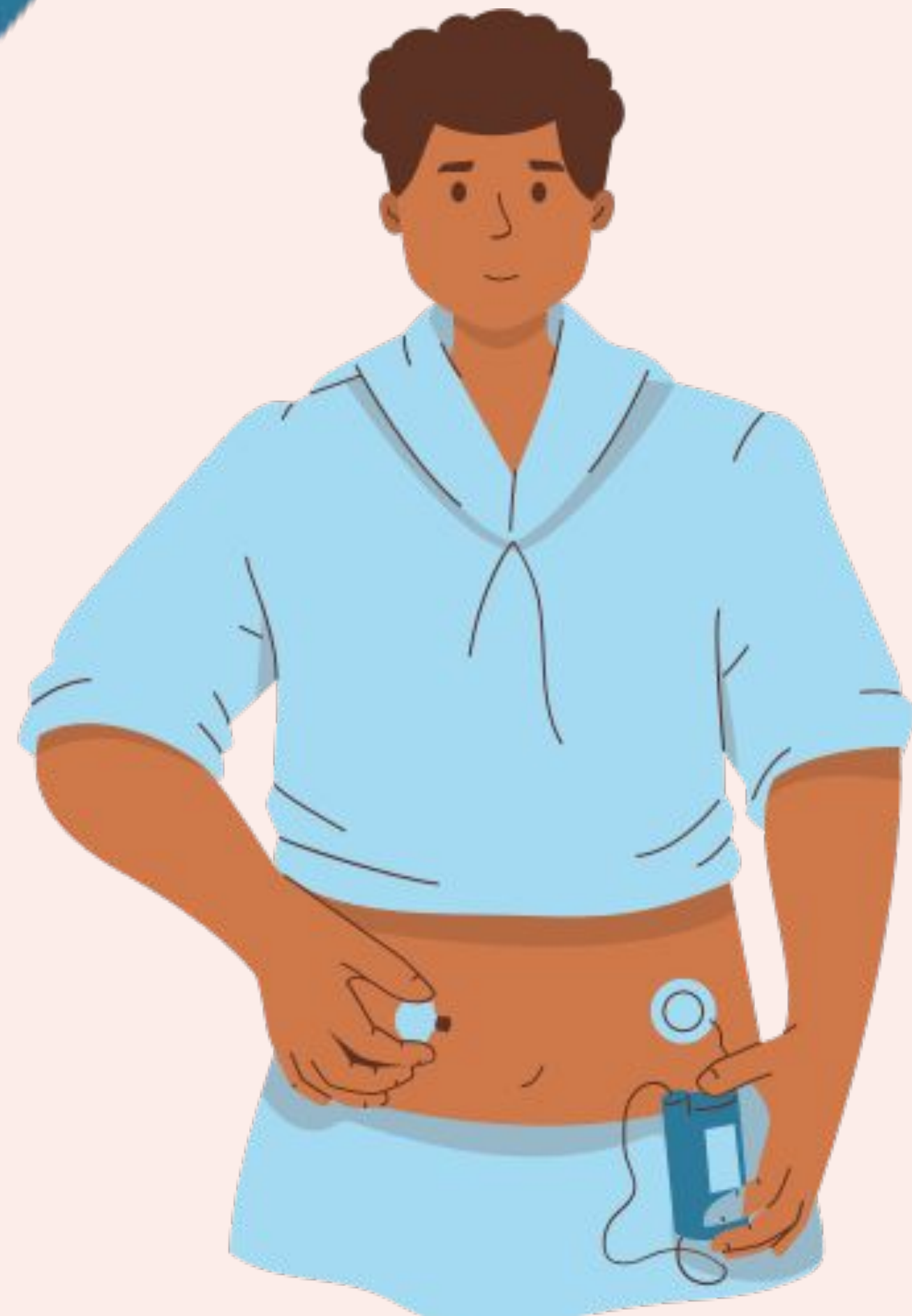
Clinical Indicators

- AIDS
- Cirrhosis
- Hepatic Failure
- Immuno-suppression

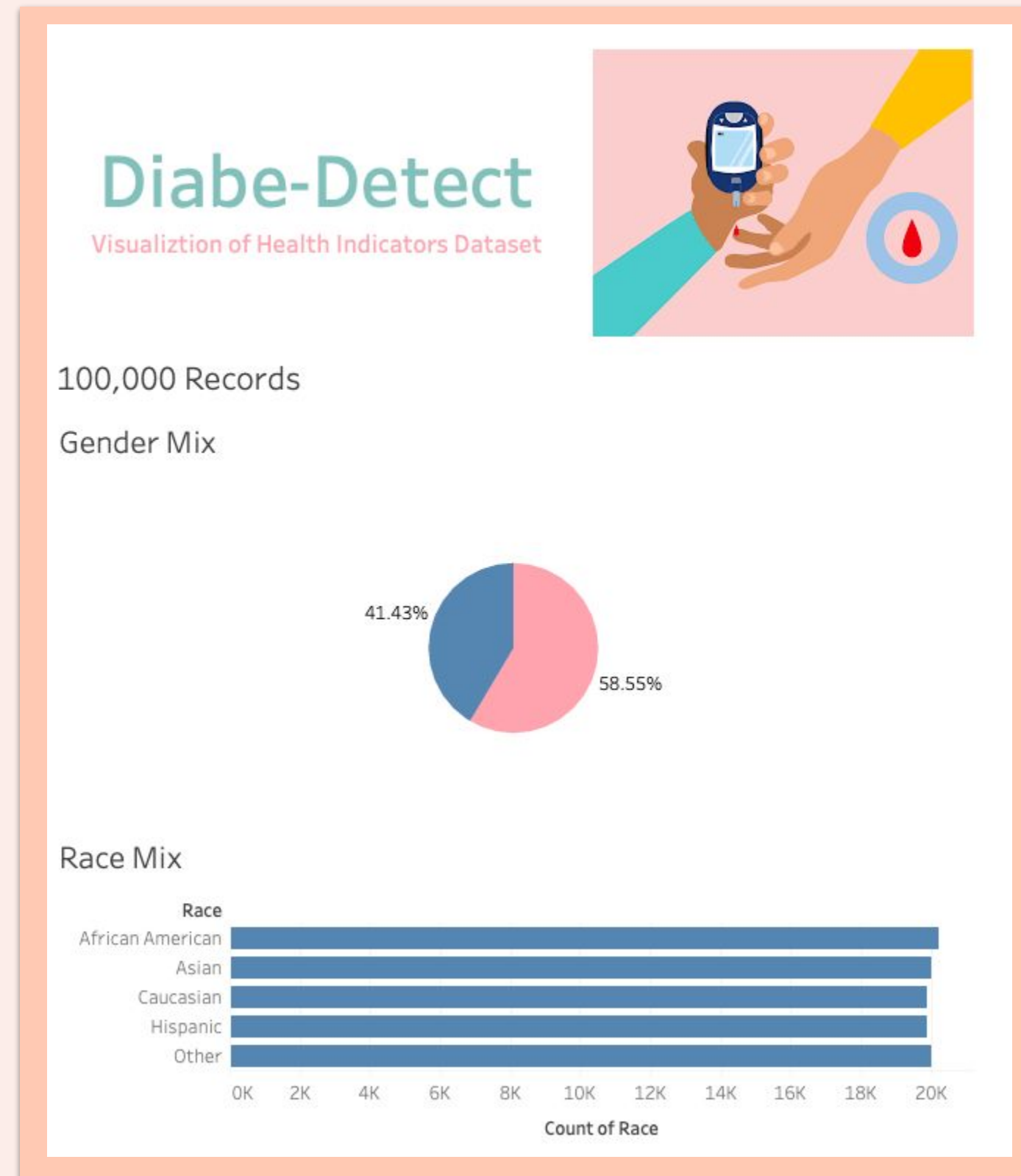
THE HEALTH INDICATORS / SDOH HAD THE STRONGEST PREDICTIONS

	Accuracy	Loss
Symptoms	0.915	0.223
Health Habits	0.814	0.499
Health Indicators/SDOH	0.949	0.202
Clinical Indicators	0.795	0.452

Dataset Visualization



Dataset Visualization



[Tableau Link](#)



Neural Network Analysis



Demo Overview

NEURAL NETWORK

Sequential Keras Model

PHASE 1

Build & Save Model

Tensorflow (keras.models)

- 3 layers

- 100 epochs

Hyperparameters (keras-tuner)

- # Neurons

- Activation Function (ReLu & Sigmoid)

Save model (*diabetes_mode.h5*)

PHASE 2

Run the model

Tensorflow (load_model)

Transform Dataset (match formatting of original dataset)

Pass new data into the model

Analyze accuracy



The image features a light cream-colored background with two large, abstract teal shapes. One shape is in the top-left corner, and the other is in the bottom-right corner. Both shapes have smooth, flowing, organic edges. Centered between these shapes is the text "THANK YOU!" in a teal, sans-serif, all-caps font.

THANK YOU!

APPENDIX

Project Requirements

- Find a problem worth solving, analyzing, or visualizing.
 - The team focused on exploring a medical use case about finding what factors predict a diabetes diagnosis. JV, Maribel, Nikko, and Stephen each performed a ML analysis on unique datasets.
- Use machine learning (ML) with the technologies we've learned.
 - Several models were tested, however, we all performed a Sequential Keras Model on our own dataset.
- You must use Scikit-learn and/or another machine learning library.
 - As part of our ML analysis, we used Scikit-learn.
- You must use at least two concepts learned in the class.
 - We used:
 - i. Python Pandas
 - ii. Python Matplotlib
 - iii. Tableau