Project Title: We Care

Student Name:- Manish Jangid

Roll no:- MC-II-49

Scope of the System:- The **We Care** project aims to design and develop a web-based application to predict the likelihood of PCOD (Polycystic Ovarian Disease) in women using machine learning. The app will provide an easy-to-use interface where users can input relevant health parameters, receive predictions on PCOD risk, and gain insights into preventive measures or next steps for their health.

Problem Statement:- Polycystic Ovarian Disease (PCOD) is a common health issue that affects women, leading to hormonal imbalance and reproductive health challenges. Currently, diagnosing PCOD can be a slow process, with reliance on multiple tests and medical consultations. This project seeks to provide a fast, AI-powered solution to predict PCOD risk based on key health indicators, using machine learning models. The goal is to offer a predictive tool that helps women take proactive steps toward their health.

Existing System:-

1) **Manual Diagnosis**: Diagnosis of PCOD usually involves consultations, lab tests, and manual analysis, which can be time-consuming and inconvenient for patients.
2) **Limited Accessibility**: Many women, especially in rural areas, have limited access to medical facilities for early PCOD detection.
3) **Lack of Awareness**: Women may not be fully aware of the risk factors and early signs of PCOD, leading to delayed diagnosis and treatment.

Proposed System:

1. **Machine Learning-Based Prediction**: Implement an ML model trained on relevant medical datasets to predict the likelihood of PCOD based on health inputs like menstrual history, BMI, glucose levels, etc.
2. **User-Friendly Interface**: Design a simple web-based interface using Streamlit that allows users to input health data and get real-time predictions.
3. **Data Security and Privacy**: Ensure all user data is securely handled, with encryption and compliance with data privacy regulations.
4. **Additional Insights**: Provide users with tips on managing PCOD risk factors and relevant medical resources for follow-up care.

Actors of the System:- There are two actors in this application.

1) User
2) Web Application

Project modules:-

1. **User Interface Module**:

- Develop a clean, intuitive interface using Streamlit.
- Provide easy access to data input forms for key health parameters.
- Display PCOD prediction results clearly, with insights and tips.

2. **Machine Learning Model Module**:

- Use Jupyter notebooks to develop and train a Random Forest or Logistic Regression model for predicting PCOD.

- Train the model on relevant medical datasets, ensuring high accuracy through hyperparameter tuning and cross-validation.
- Save the trained model and integrate it with the Streamlit interface for real-time predictions.

3. **Data Preprocessing and Feature Engineering Module**:

- Handle missing data and perform feature selection based on the most relevant health indicators.
- Scale and standardize data for input into the model.
- Optimize feature engineering to improve model performance.

4. **Privacy and Security Module**:

- Implement data security measures such as encryption for storing and transmitting sensitive health data.
- Ensure compliance with user privacy and provide control over how their data is used.

5. **Visualization and Insights Module**:

- Display visualizations of key health metrics using Matplotlib/Seaborn for better user understanding.
- Provide actionable insights based on model predictions and recommendations for preventive measures.

Hardware and Software Requirements:-

Software Requirements

- **Front End:** Streamlit, Python
- **Operating System:** Windows, macOS, or Linux
- **Tool**: Jupyter Notebook, Scikit-learn, Pandas, NumPy
- **Backend:** Machine Learning model (Random Forest, Logistic Regression)

Hardware Requirements

- **Device:** Any device with a web browser (for end-user)
- **RAM:** 4 GB or More
- **Processor**: Dual Core or Better
- **Storage:** 500 MB for app data and machine learning model storage
- **Internet Connection:** Required for accessing the app and making predictions