**Project Title: Fetal Health Checkup Machine Learning Model**

**1. Introduction:**

Developing a machine learning model to classify fetal health status based on Cardiotocogram (CTG) data. The dataset includes features such as fetal heart rate, movements, and uterine contractions, with the target variable having three classes: 'Normal', 'Pathological', and 'Suspect'. The goal is to create a reliable classification tool to aid healthcare professionals in identifying pregnancies at risk and reducing child and maternal mortality rates, especially in low-resource settings.

**2. Objective:**

The project aims to develop an AI-driven solution for predicting and monitoring fetal health using Cardiotocogram (CTG) data. By classifying CTG recordings into 'Normal', 'Pathological', and 'Suspect' categories, the proposed solution seeks to assist healthcare professionals in early identification of potential risks to both maternal and fetal well-being, thereby contributing to the reduction of child and maternal mortality rates.

**3. Scope:**

It can be used to create a reliable classification tool to aid healthcare professionals in identifying pregnancies at risk and reducing child and maternal mortality rates, especially in low-resource settings. The proposed solution seeks to assist healthcare professionals in early identification of potential risks to both maternal and fetal well-being, thereby contributing to the reduction of child and maternal mortality rates.

Approach:

1. Data Collection: Gather CTG datasets containing features such as fetal heart rate, movements, and uterine contractions. We take dataset from kaggle.

2. Data Preprocessing: Clean and preprocess the data to handle missing values, outliers, and standardize features.

3. Model Development: Utilize machine learning algorithms such as Random Forest, Gradient Boosting, and Neural Networks to train a classification model.

4. Model Evaluation: Assess the performance of the trained model using metrics like accuracy, precision, recall, and F1-score through cross-validation techniques.

5. Deployment: Implement the trained model into a user-friendly interface accessible to healthcare professionals for real-time fetal health monitoring.

**4. Methodology:**

   -> Data Collection:

     -> data collected from Kaggle.com (<https://www.kaggle.com/datasets/andrewmvd/fetal-health-classification>)

   -> Model Development:

     -> we use classification technique.

     -> we used RandomForest Algorithm.

   -> Evaluation:

     -> we tested our dataset on multiple classifier at the end we get 94.67 prediction rate on randomforestclassifier algorithm.

**5. Timeline:**

     -> Data collection and preprocessing.(1day)

     -> Model development and testing.(2 days)

     -> Deployment and integration.(2 days)

**6. Resources:**

   -> Resources used:

     -> Kaggle.com: Data collections.

     -> Hardware: windows OS with 16 RAM and 8GPU.

     -> Software: VS Code, Jupyter, google, Kaggle, git & github.

**7. References:**

    -> data collection – Kaggle.com.

    -> Guide – smartinternz complete article