Fetal Health Project

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Backstory

We have made a study about fetal health classification based on many factors like (Baseline Fetal Heart Rate, Number of accelerations per second, Number of fetal movements per second, uterine contractions). Cardiotocography (CTG) is used during pregnancy to monitor fetal heart rate and uterine contractions. It is monitors fetal well-being and allows early detection of fetal distress. CTG interpretation helps in determining if the pregnancy is high or low risk. An abnormal CTG may indicate the need for further investigations and potential intervention.

Target & goal

We Classify which the fetus is normal or not

o Y= is Fetal health (normal or Suspect or Pathological)
o X= is features in table is 22 columns

Steps for execute project

- Import all libraries our need it

  - NumPy.
  - Pandas.
  - Sklearn.
  - Matplotlib.
  - Seaborn.

- Load and read data
  - fetal_health.csv.
- Verifying Basic Data Integrity

  - data.shape
  - data.info()
  - data.head()

- Visualizing to Show the data (hist , correlations…)

  - Histogram of all columns
  - Fetal target

- EDA to Cleaning data

  - Duplicate
  - Null value
  - Messing

- Draw correlation matrix to view the columns affect to fetal health.

- Draw the relationship between fetal health and all columns.

o   Start Modelilng :

1-   Split the data to train & test , select y and x and scaling data .
2-   Draw boxenplot to check if have outlier.
3-   The models we used are :

   ➢ Model 1 : Logistic regression.
   ➢ Model 2 : Random forest.
   ➢ Model 3 : Knn.

4-   We worked in each model:

   ➢ Ovr.
   ➢ Fit.
   ➢ Predict Y.
   ➢ Calculate the Accuracy.
   ➢ Cross Validation Score.
   ➢ Evaluation Procedure:
      • MAE
      • MSE
      • RMSE
      • R^2
   ➢ Classification Report.
   ➢ Evaluation by:
      • Accuracy.
      • Recall.
      • Precision.
      • F1 Score.

5-   Evaulation the model and Visualising the Training set results