
Welcome!

EARLY PREDICTION OF LOW BIRTH WEIGHT CASE USING MACHINE LEARNING

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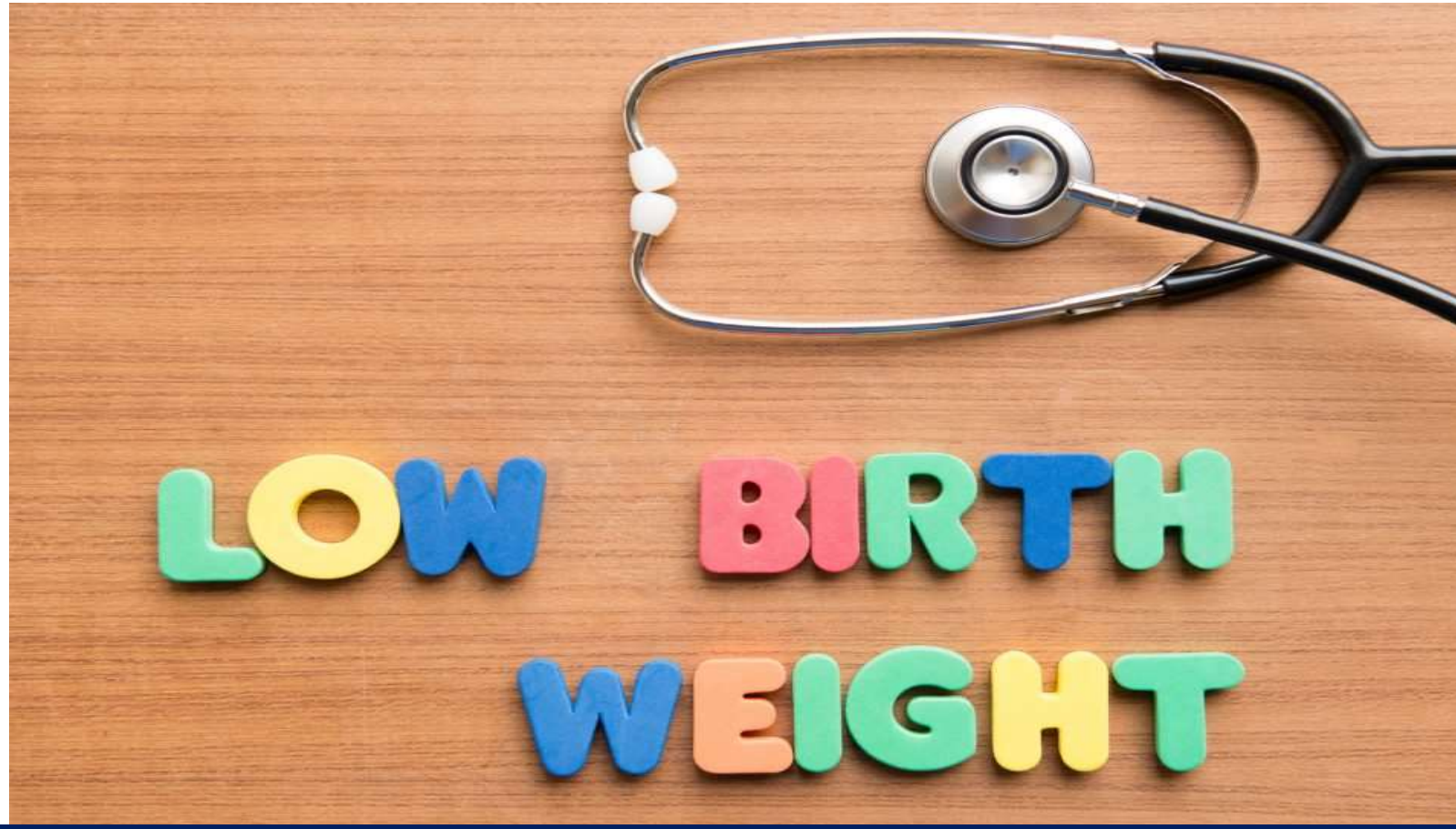
Agenda

- *Introduction of Project*
- *Existing system*
- *Proposed system*
- *Software and hardware requirements*
- *Data flow diagram*
- *Algorithm used*
- *Libraries*
- *Screenshot*
- *Future Enhancement*
- *Conclusion*



INTRODUCTION OF PROJECT

- Low birth weight is the term used to refer to babies born with a weight less than 2500gm.
- Low birth weight (LBW) has been identified as a major public health problem around the world.
- LBW includes both pre-term babies as well as fully grown babies who are very small in size as a consequence of intra uterine growth retardation.
- Birth weight is closely associated with neonatal and infant mortality, mortality rates being significantly higher in LBW babies when compared to the normal birth weight (NBW) babies.

Existing system

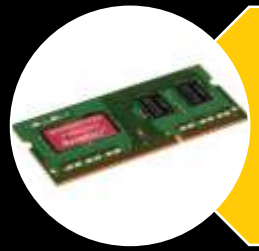
- It's a dynamic field with various approaches.
- Tools like INTERGROWTH-21st rely on established risk factors like age, weight, and medical history, offering a readily available starting point.
- Algorithms like XGBoost show promise in utilizing electronic health records, while deep learning holds potential with larger datasets and specialized expertise.

Proposed system

- We implement supervised machine learning algorithms like XGBoost Classifier, Random Forest Classifier and Support Vector Classifier and Decision Tree Classifier for prediction of low-Birth-Weight babies.
- Gather pertinent information from surveys, medical exams, pregnancy registers and Electronic health records.
- This could consists of Socioeconomic and Demographic data pertaining data to mother medical background and present state of health Measurements and test related to pregnancy, inconsistent data formats.
- Combine data in a inconsistent manner for analysis of integrating data from many sources.
- Draw a relevant conclusion that aid in the prediction of Low Birth Weight.

Hardware Requirements

Processor : i3 intel Processor



RAM : 4GB(Min)

Hard Disk : 128GB

Software Requirements

Operating System :Windows 11

Front-end :HTML

Back-end : Python 3.12

IDE :Visual studio

Data flow diagram

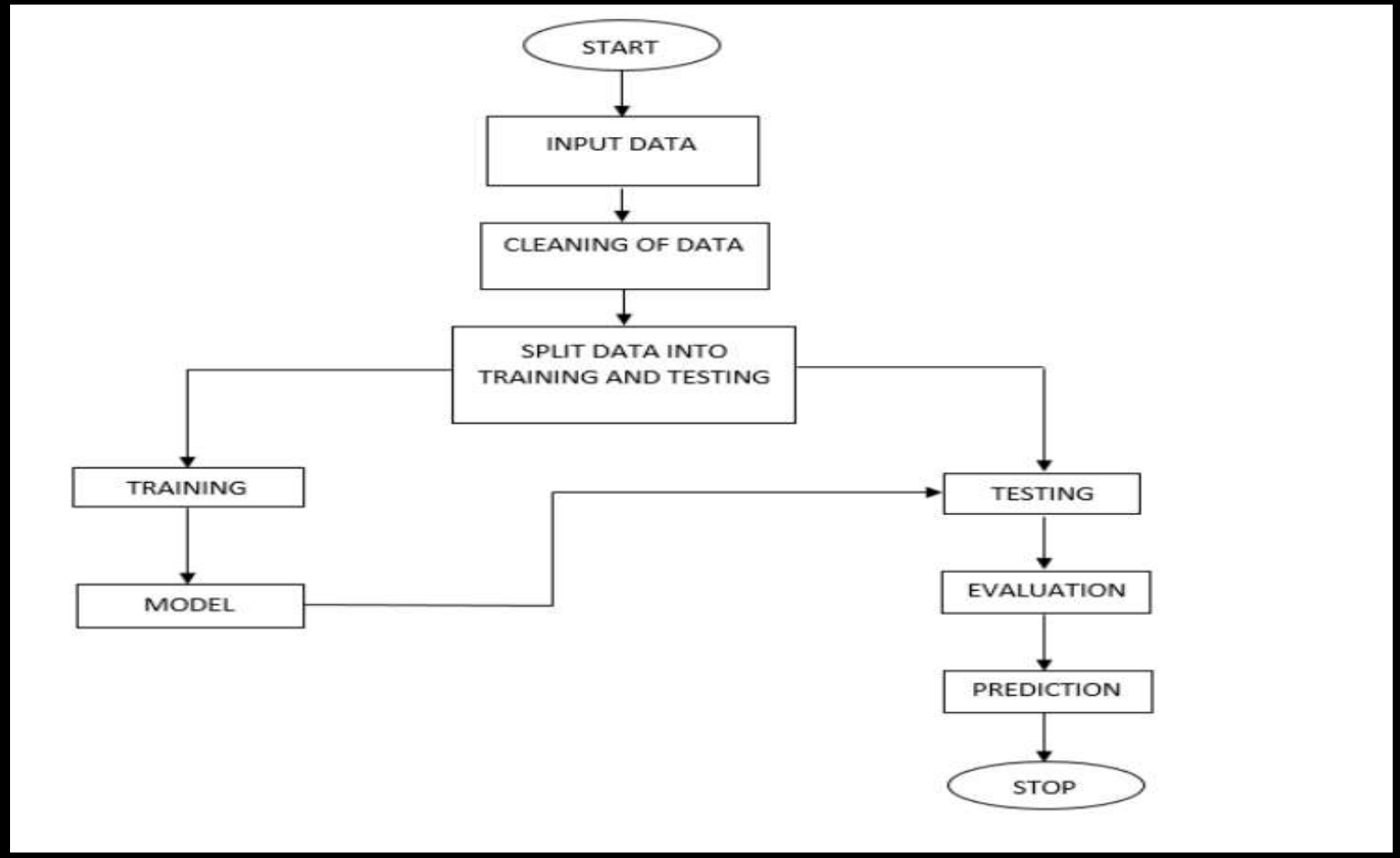
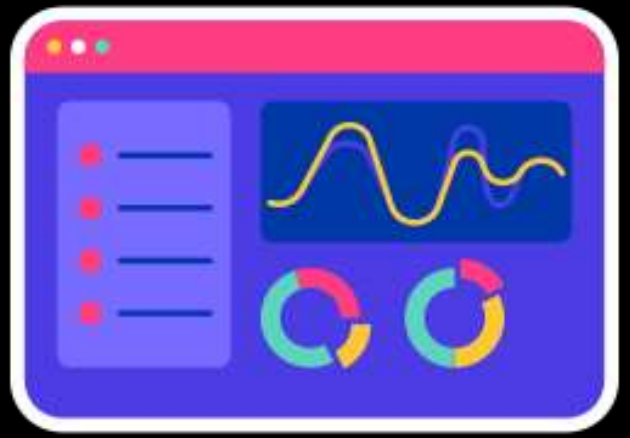


Fig.1 Data Flow Diagram

Algorithm used



Machine learning algorithms like

XGBoost Classifier, Random Forest Classifier and Support Vector Classifier and Decision Tree Classifier for prediction of low-Birth-Weight babies.

1. XGBoost Classifier:

Boasts high accuracy due to boosting and handles large datasets effectively. Can identify important risk factors through feature importance scores.

2. Random Forest Classifier:

Offers balance between accuracy and robustness with bagging, preventing overfitting. Suitable for diverse datasets and categorical features. Relatively easy to interpret with feature importance insights.

3. Support Vector Classifier (SVC):

Effective for high-dimensional data with sparse features, often relevant in biological domains like predicting LBW.

4.Decision Tree Classifier:

Easy to understand and interpret, providing valuable insights into decision-making logic.

Libraries used:

- **Pandas:** The essential library for data manipulation and cleaning.
- **NumPy:** Foundation for numerical computations and array operations.
- **Matplotlib and Seaborn**: Visualization libraries for creating compelling charts and graphics.

Screen shots

Fig.2 Screen Shot of Home Page

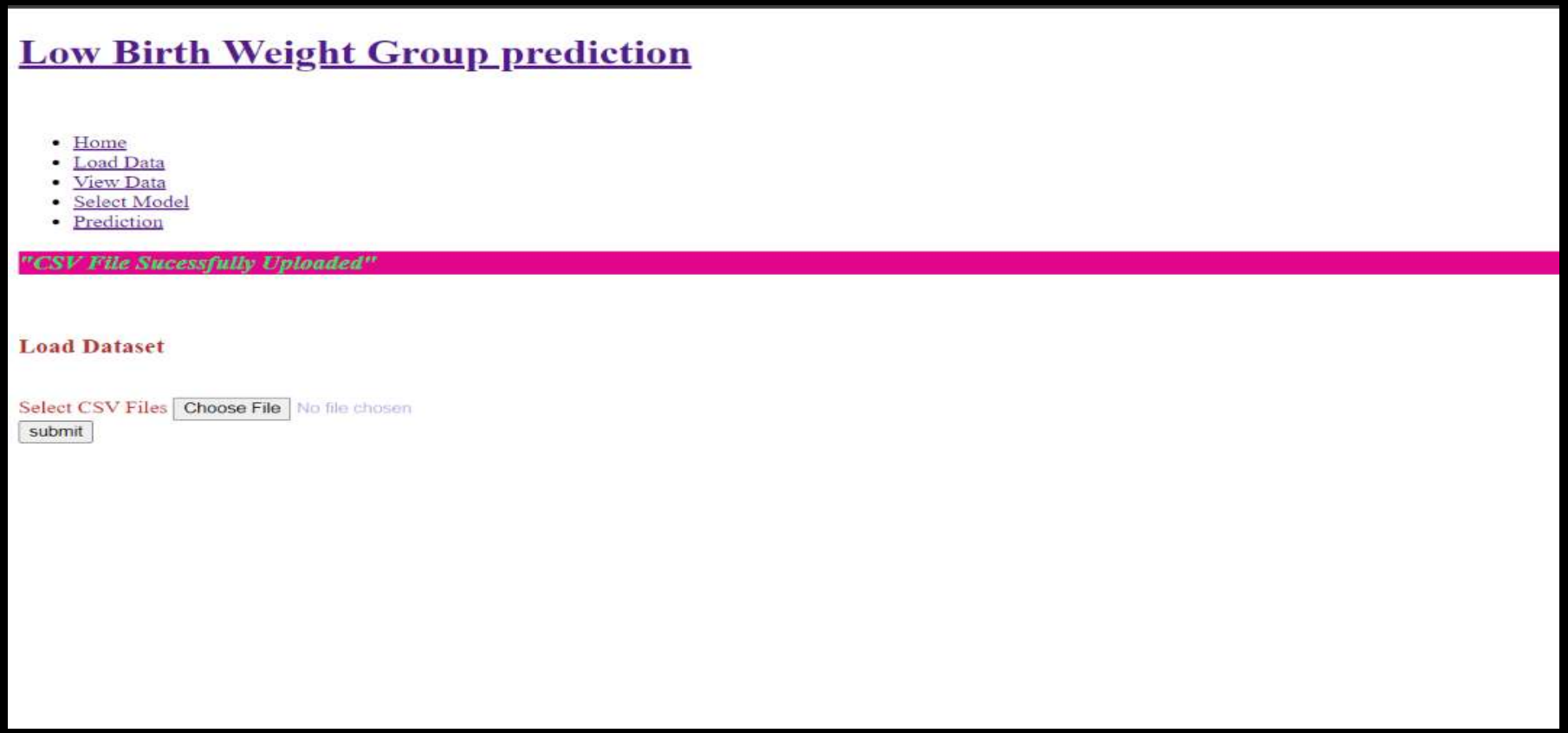
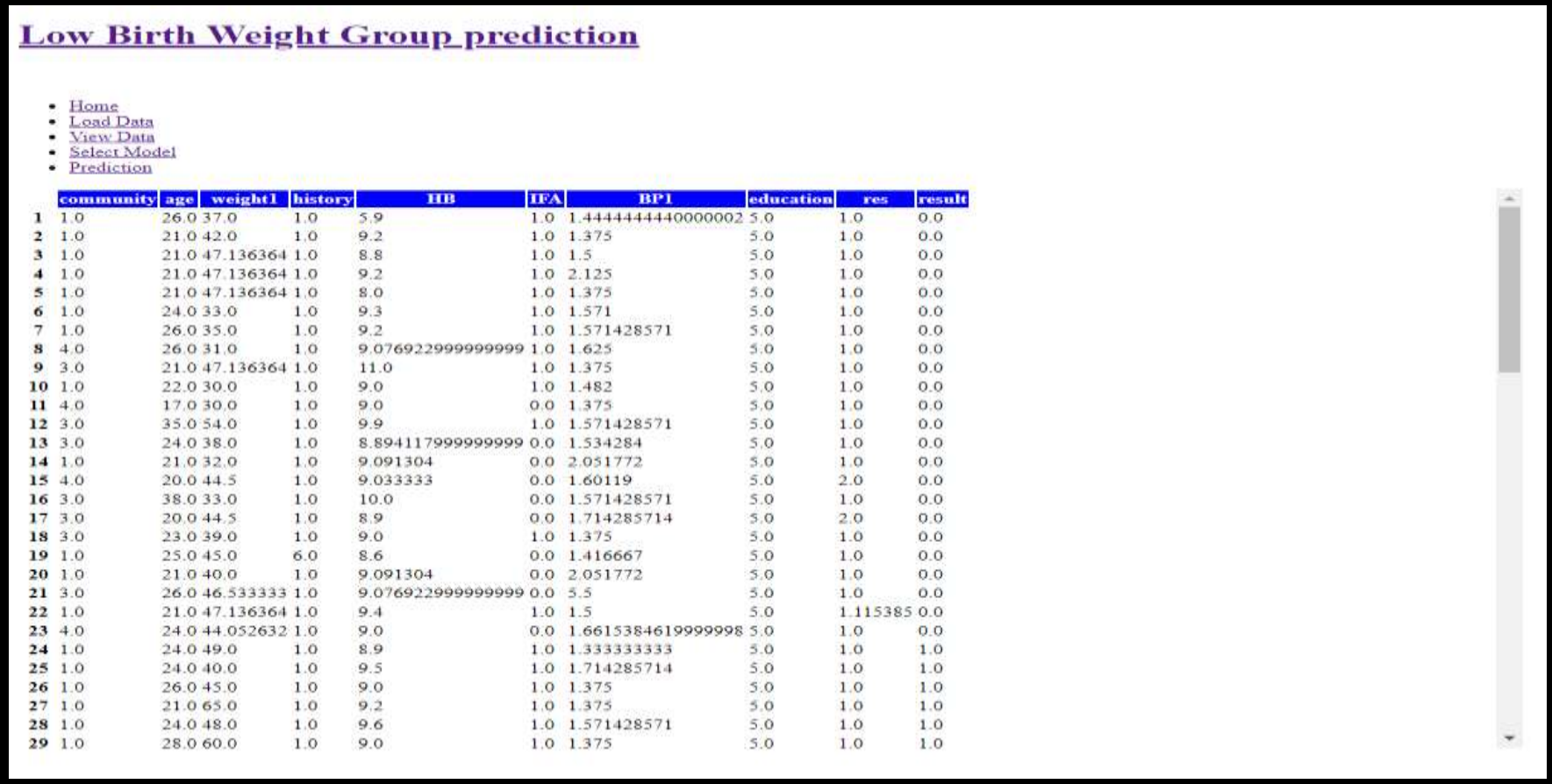


Fig.3 Screenshot of Load Data Page



	community	age	weight1	history	HB	IFA	BP1	education	res	result
1	1.0	26.0	37.0	1.0	5.9	1.0	1.4444444440000002	5.0	1.0	0.0
2	1.0	21.0	42.0	1.0	9.2	1.0	1.375	5.0	1.0	0.0
3	1.0	21.0	47.136364	1.0	8.8	1.0	1.5	5.0	1.0	0.0
4	1.0	21.0	47.136364	1.0	9.2	1.0	2.125	5.0	1.0	0.0
5	1.0	21.0	47.136364	1.0	8.0	1.0	1.375	5.0	1.0	0.0
6	1.0	24.0	33.0	1.0	9.3	1.0	1.571	5.0	1.0	0.0
7	1.0	26.0	35.0	1.0	9.2	1.0	1.571428571	5.0	1.0	0.0
8	4.0	26.0	31.0	1.0	9.076922999999999	1.0	1.625	5.0	1.0	0.0
9	3.0	21.0	47.136364	1.0	11.0	1.0	1.375	5.0	1.0	0.0
10	1.0	22.0	30.0	1.0	9.0	1.0	1.482	5.0	1.0	0.0
11	4.0	17.0	30.0	1.0	9.0	0.0	1.375	5.0	1.0	0.0
12	3.0	35.0	54.0	1.0	9.9	1.0	1.571428571	5.0	1.0	0.0
13	3.0	24.0	38.0	1.0	8.894117999999999	0.0	1.534284	5.0	1.0	0.0
14	1.0	21.0	32.0	1.0	9.091304	0.0	2.051772	5.0	1.0	0.0
15	4.0	20.0	44.5	1.0	9.033333	0.0	1.60119	5.0	2.0	0.0
16	3.0	38.0	33.0	1.0	10.0	0.0	1.571428571	5.0	1.0	0.0
17	3.0	20.0	44.5	1.0	8.9	0.0	1.714285714	5.0	2.0	0.0
18	3.0	23.0	39.0	1.0	9.0	1.0	1.375	5.0	1.0	0.0
19	1.0	25.0	45.0	6.0	8.6	0.0	1.416667	5.0	1.0	0.0
20	1.0	21.0	40.0	1.0	9.091304	0.0	2.051772	5.0	1.0	0.0
21	3.0	26.0	46.533333	1.0	9.076922999999999	0.0	5.5	5.0	1.0	0.0
22	1.0	21.0	47.136364	1.0	9.4	1.0	1.5	5.0	1.115385	0.0
23	4.0	24.0	44.052632	1.0	9.0	0.0	1.6615384619999998	5.0	1.0	0.0
24	1.0	24.0	49.0	1.0	8.9	1.0	1.333333333	5.0	1.0	1.0
25	1.0	24.0	40.0	1.0	9.5	1.0	1.714285714	5.0	1.0	1.0
26	1.0	26.0	45.0	1.0	9.0	1.0	1.375	5.0	1.0	1.0
27	1.0	21.0	65.0	1.0	9.2	1.0	1.375	5.0	1.0	1.0
28	1.0	24.0	48.0	1.0	9.6	1.0	1.571428571	5.0	1.0	1.0
29	1.0	28.0	60.0	1.0	9.0	1.0	1.375	5.0	1.0	1.0

Fig.4 Screenshot of View Data Page

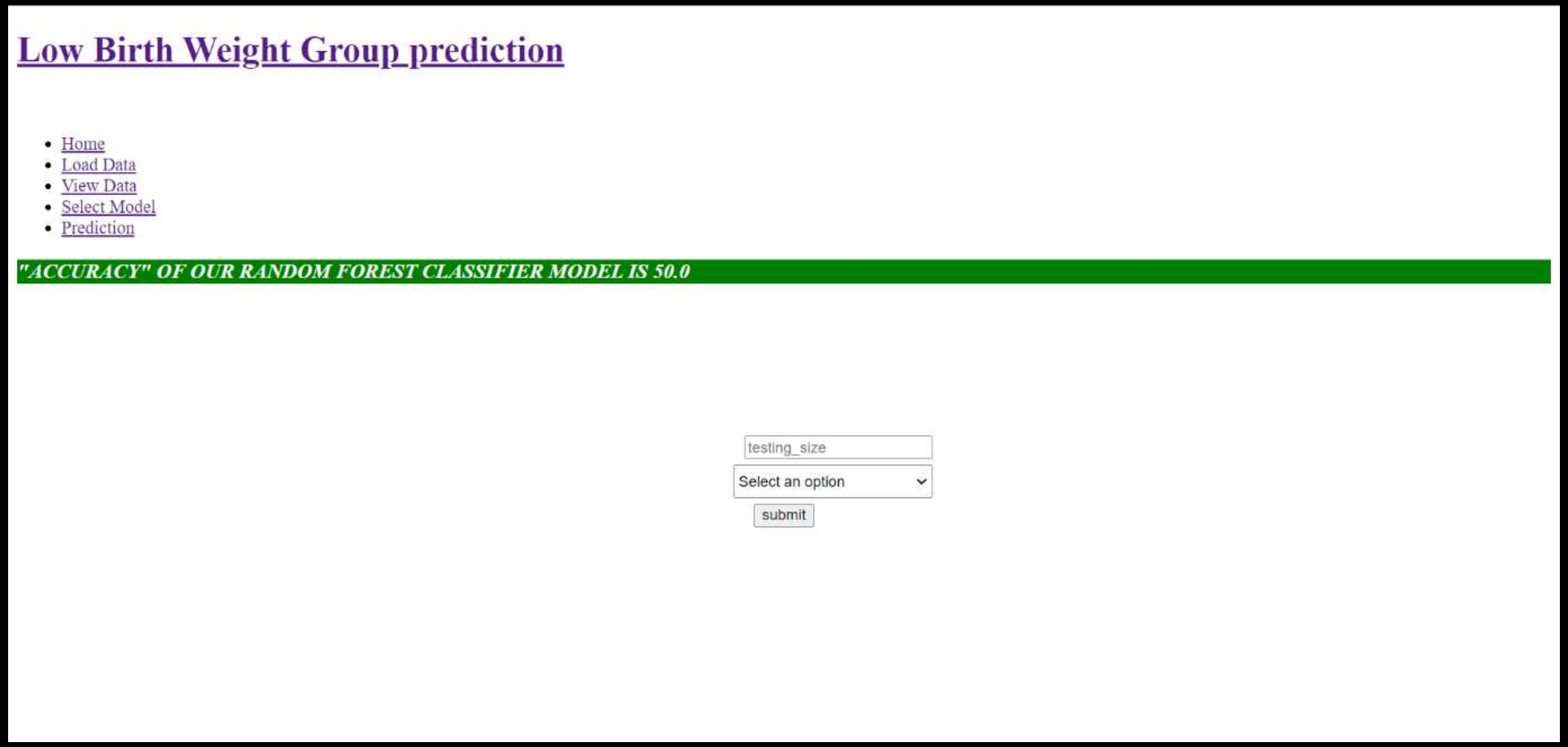


Fig.5 Screenshot of select model Page

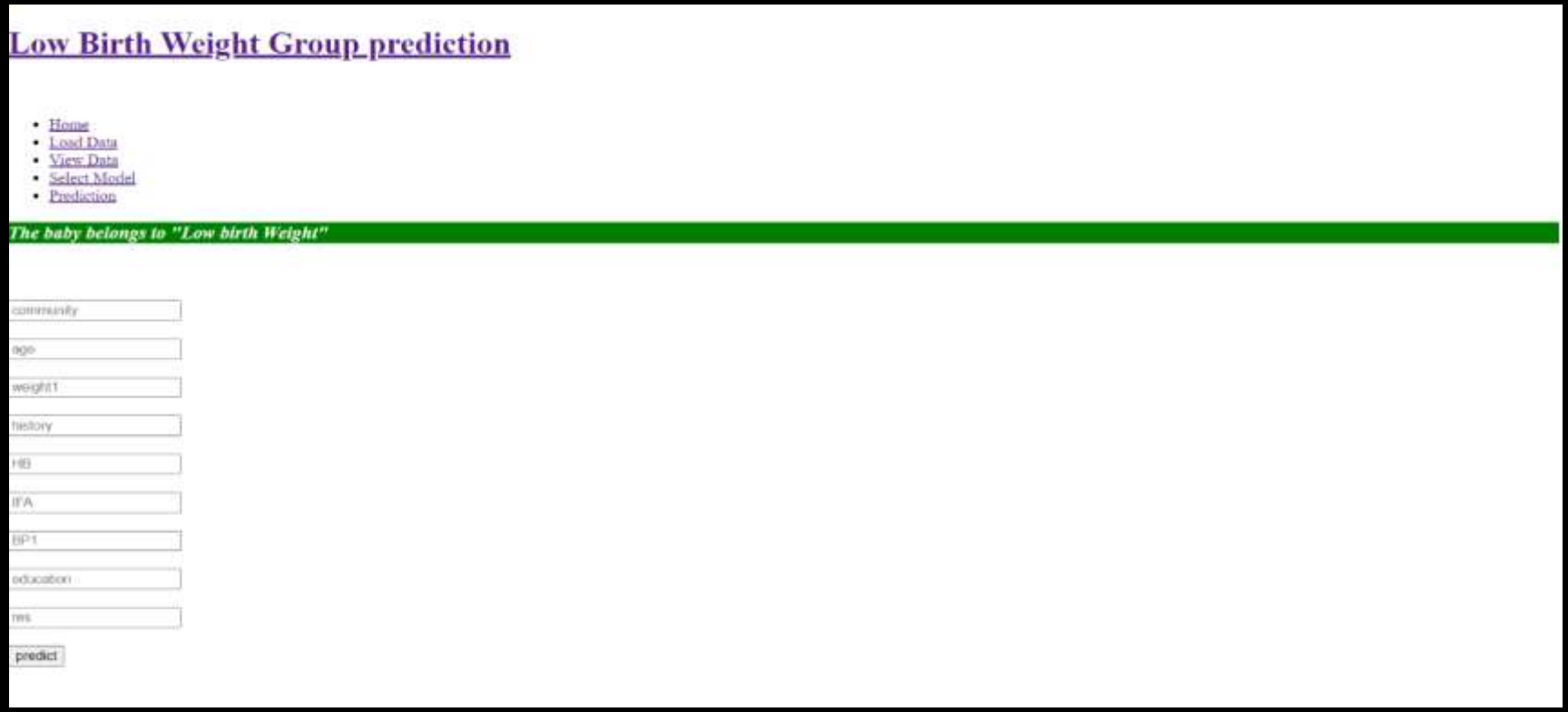


Fig.6 Screenshot of Prediction of LBW Page

Future enhancement

Incorporate genomic and epigenetic data Analyze maternal and fetal genetic markers and methylation patterns to identify early pregnancy biomarkers associated with LBW risk. Utilize wearable devices or smartphone apps to monitor maternal biometric factors like heart rate, sleep patterns, and physical activity, potentially contributing to dynamic risk assessment. Social determinants of health Include data on social factors like socioeconomic status, access to healthcare, and food insecurity to gain a more holistic understanding of LBW risk.

Conclusion

Potential benefits using machine learning for early LBW prediction in improving maternal and child health outcomes. Identify specific advancements and contributions made by the project to the field of LBW prediction and prevention.


Thank
you