**Low Level Design Document**

**Thyroid Disease Prediction**

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**1. Introduction**

The Low-Level Design (LLD) document outlines the internal logical design of the Thyroid Disease Prediction project. It describes the detailed structure and functionality of the components involved in the project implementation.

**2. Architecture**

The architecture of the Thyroid Disease Prediction project follows a client server model, where a Flask web application serves as the interface for users to input their data and receive predictions. The architecture includes the following components:

**Client Side:** HTML templates and JavaScript for user interaction.

**Server Side:** Flask framework for handling requests, predicting thyroid disease using a machine learning model, and serving responses.

**3. Components**

Data Collection

* Utilizes a pre existing dataset of thyroid disease related features.
* Dataset may be expanded in the future for improved accuracy.

Data Preprocessing

* Cleans and preprocesses the input data.
* Handles missing values, categorical encoding, and scaling.

Model Development

* Trains a machine learning model (decision tree) on the preprocessed data.
* The trained model is serialized and saved for deployment.

Web Application

* Utilizes Flask to create a web interface for users.
* Provides input forms for users to input their data.
* Renders prediction results based on user input.

**4. Technology Stack**

* Backend: Python, Flask
* Machine Learning: Scikit learn
* Frontend: HTML, CSS, JavaScript
* Deployment: AWS

**5. Deployment**

The Flask web application is deployed on AWS for accessibility.

Utilizes AWS Elastic Beanstalk or similar services for easy deployment and scaling.

**6. Testing and Validation**

Unit tests are implemented to validate the functionality of individual components.

Integration tests ensure the seamless interaction between different modules.

Manual testing is performed to validate user experience and prediction accuracy.

**7. Challenges and Considerations**

* Data Quality: Ensuring the quality and reliability of input data.
* Model Accuracy: Continuously improving the accuracy of the prediction model.
* Scalability: Designing the system to handle a growing user base efficiently.

**8. Future Enhancements**

* Feature Expansion: Incorporating additional features for better prediction accuracy.
* User Experience: Enhancing the web interface for improved usability.
* Real time Updates: Implementing real time prediction updates based on new data.

**9. Conclusion**

The Thyroid Disease Prediction project aims to provide a user friendly interface for predicting thyroid disease based on input data. With a robust architecture and scalable design, the project holds potential for future enhancements and advancements in thyroid disease detection.