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Low Level Design

Thyroid Disease Detection System

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1. **Introduction**

## What is Low-Level design document?

The goal of LLD or a low-level design document (LLD) is to give the internal logical design of the actual program code for Thyroid Disease Detection System. LLD describe the class diagrams with the methods and relations between classes and program specs. It describe the modules so that the programmer can directly code the program from the document.

## Scope

Low-level design (LLD) is a component-level design process that follows a step-by-step refinement process. This process can be used for designing data structures, required software architecture, source code and ultimately, performance algorithms. Overall, the data organization may be defined during requirement analysis and then refined during data design work.

## Architecture

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Start

Export predicted data to csv

End

Best model saving

Cloud setup

Pushing app to cloud

Application

Start

Data from client to predict

Applying hyper parameter tuning

Applying different algorithm to gest best model

Data Transformation

Data Preprocessing

Export data from database to csv for training

# Architecture Description

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## Data Description

We will be using Thyroid Disease Data Set present in UCI Machine Learning Repository. This Data set is satisfying our data requirement. Total 7200 instances present in different batches of data.

## Export Data from database to CSV for Training

Here we will be exporting all batches of data from database into one csv file for training.

## Data Preprocessing

We will be exploring our data set here and do EDA if required and perform data preprocessing depending on the data set. We first explore our data set in Jupyter Notebook and decide what pre-processing and Validation we have to do such as imputation of null values, dropping some column, etc and then we have to write separate modules according to our analysis, so that we can implement that for training as well as prediction data.

## Get best model of each cluster

Here we will train various model on each cluster which we will obtain in Data Clustering, and then will try to get best model of each cluster.

## Hyper parameter Tuning

After selecting best model for each cluster, we will do hyper parameter tuning for each selected model, and try to increase performance of the models.

## Model Saving

After performing hyper parameter tuning for models, we will save our models so that we can use them for prediction purpose.

## Cloud Setup

Here we will do cloud setup for model deployment. Here we also create our

flask app and user interface and integrate our model with flask app and UI

## Push app to cloud

After doing cloud setup and checking app locally, we will push our app to cloud to start the application.

## Data from client side for prediction purpose

Now our application on cloud is ready for doing prediction. The prediction data which we receive from client side will be exported from DB and further will do same data cleansing process as we have done for training data using modules we will write for training data. Client data will also go along the same process of **Exporting data from DB**, **Data pre-processing**, **Data clustering** and according to each cluster number we will use our **saved model** for prediction on that cluster.

## Export Prediction to CSV

Finally when we get all the prediction for client data, then our final task is to export prediction to csv file and hand over it to client.

1. **Unit Test Cases**

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**Test Case Description**

**Pre-Requisite**

**Expected Result**

Verify whether the Application URL is accessible to the user

Verify whether the Application loads completely for the user when the URL is accessed

Verify whether the User is able to sign up in the application

Verify whether user is able to successfully login to the application

Verify whether user is able to see input fields on logging in

Verify whether user is able to edit all input fields

Verify whether user gets Submit button to submit the inputs

1. Application URL should be defined 1.Application URL

is accessible 2.Application is deployed

1. Application is accessible

1. Application is accessible
2. User is signed up to the application
3. Application is accessible
4. User is signed up to the application 3.User is logged in to the application
5. Application is accessible
6. User is signed up to the application 3.User is logged in to the application
7. Application is accessible
8. User is signed up to the application 3.User is logged in to the application

Application URL should be accessible to the user

The Application should load completely for the user when the URL is accessed

The User should be able to sign up in the application

User should be able to successfully login to the application

User should be able to see input fields on logging in

User should be able to edit all input fields

User should get Submit button to submit the inputs