High Level Design (HLD)

Wheat Kernel Classification

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SHAHIN ANJUM

K M SUMANTH

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**Abstract**

­ For this Internship, I examine the Wheat kernel classification dataset available at the UC Irvine Machine Learning Repository and Kaggle. I aim to build a model for find the variety (classification) of wheat after harvest on the bases of given attributes.

**Introduction**

Classification of wheat after harvest is a challenging task. Several techniques are prevalent for measuring the geometrical parameters of the wheat and for scrutinizing the wheat seeds. Parameters used for the classifier includes area, perimeter, compactness, length of kernel, width of kernel, asymmetry coefficient, length of kernel groove. Neural network pattern recognizer is used for the classification of the wheat seeds in this paper. The database for the Wheat seed is downloaded from the UCI machine learning repository. MSE, Accuracy Score Calculated as performance measure. Results show that Decision Tree classifier give most accuracy 95%.

**Why this High-Level Design Document?**

The main purpose of this HLD documentation is to feature the required details of the project and supply the outline of the machine learning model and the written code. This additionally provides the careful description on however the complete project has been designed end-to-end.

**1 Description**

**1.1 Problem Perspective**

I am building a model to predict the variety of wheat based on several attributes from the given data.

**1.2 Problem Statement**

The most goal of the project is to form a programme that predicts the variety of wheat seed by taking bound input from the user like includes area, perimeter, compactness, length of kernel, width of kernel, asymmetry coefficient, length of kernel groove.

**1.3 Project Solution**

Project requires the desired input of user from the created interface and method all the provided information to satisfy the wants of the machine learning model and at last show the expected output.

**1.4 Technical Requirements**

There are not any hardware needs needed for victimization this application, the user should have AN interactive device that has access to the web and should have the fundamental understanding of providing the input. And for the backend half the server should run all the package that's needed for the process and provided information to show the results.

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|  | **1.5 Data Requirements** |

The info demand is totally supported the matter statement and the information set is accessible on the UCI within the type of standout sheet(.data), because the main theme of the project is to induce the expertise of real time issues, we tend to once more mercantilism {the information into the prophetess data base and commerce it into csv format.

**1.6 Tools Used**

* Python 3.8 is employed because the programming language and frame works like numpy, pandas, sklearn and alternative modules for building the model.
* Vscode is employed as IDE(integrated development environment).
* For visualizations seaborn and components of matplotlib are getting used.
* For information assortment prophetess info is getting used.
* Front end development is completed victimization HTML/CSS.
* Flask is employed for each information and backend readying.
* GitHub is employed for version management.

**1.7 Constraints**

The Wheat kernel classification answer should be user friendly, as automatic as attainable and the user should not be needed to understand any of the operating.

**1.8 Assumptions**

The most objective of the project is to implement the utilization cases as for the new dataset that user provides through the programme. Machine learning model is employed for process the on top of computer file. It's additionally assumed that each one aspects of this project have the flexibility to figure along within the approach as the designer is expecting.

**2.3 Logging**

Each step is being logged within the system that runs internally, that shows the date time and therefore the processed that has been performed, work is completed in several layers as information, DEBUG, ERROR, WARNINGS. this provides US the perceive of the logged info.

**2.4 Error Handling**

Once ever a slip is occurred, the reason is logged in its several log file, in order that the developer will rectify the error.

**3 Performance Evaluation**

**3.1 Reusability**

Elements of the code written is accustomed different applications and therefore the rest is changed and be reused.

**3.2 Application Compatibility**

The various parts for this project are exploitation python as associate interface between them. every element can have its own tasks to perform, and it's the work of the python to make sure correct transfer of data.

**3.3 Resource Utilization**

Once any task is performed, it'll doubtless; use all the process power offered till that performs is finished.

**Conclusion**

The Wheat kernel classification will predict the worth supported the trained knowledge set within the rule. therefore, the user will know the variety(classification) of seed.