# High Level Design (HLD)

# MUSHROOM CLASSIFICATION

## CHHOTTU DA MODAK

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## Abstract

This project focuses on the development of a robust machine learning-based system for classifying mushrooms, a diverse group of fungi with critical ecological, culinary, and medicinal roles. Given the difficulty in visually differentiating edible mushrooms from toxic ones, our approach aims to enhance accuracy and reliability in species identification, with a particular emphasis on distinguishing between toxic and non-toxic varieties.

# High Level Design (HLD)

## ☐ Introduction

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

The primary objective of this High-Level Design (HLD) documentation is to provide comprehensive details about the project, including an overview of the machine learning model and the associated code. It also offers a detailed description of the end-to-end design and implementation of the entire project.

### Description

### 1.1 Problem Perspective

The Mushroom classification model utilizes machine learning techniques to predict whether a mushroom is edible or toxic.

### 1.2 Problem Statement

The Audubon Society Field Guide to North American Mushrooms provides detailed descriptions of theoretical examples representing 23 species of gilled mushrooms within the Agaricus and Lepiota families (1981). Each species is categorized as either definitely edible, definitely poisonous, or potentially edible but not recommended. The latter category has been combined with the toxic category. The Guide clearly states that there is no straightforward rule for determining a mushroom’s edibility, unlike the "leaflets three, leave it be" rule for Poison Ivy and Oak. The primary objective is to identify which mushrooms are poisonous and which are edible.

## 1.3 Project Solution

The project necessitates that the user provide the required input through the developed interface and method. This information is then processed to meet the needs of the machine learning model, ultimately yielding the anticipated output.

## 1.4 Technical Requirements

There are no specific hardware requirements for using this application. Users need only an interactive device with internet access and a basic understanding of how to input data. On the backend, the server must have all the necessary software installed to process the data and generate results.

## 1.5 Data Requirements

Data Requirement completely depend on our problem.
For training and testing the model, we are using Mushroom Classification dataset that is provided by Ineuron Company.
From user we are taking following input:

**cap-shape**
**Cap-surface**
**cap-color**
**bruises**
**odor**
**Gill-attachment**
**Gill-spacing**
**Gill-size**
**Gill-color**
**stalk-shape**
**Stalk-root**
**Stalk-surface-above-ring**
**Stalk-surface-below-ring**

**Stalk-color-above-ring**
**stalk-color-below-ring**
**Veil-color**
**ring-number**
**Ring-type**
**Spore-print-color**
**population**
**Habitat**

## 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.
- 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.
- AWS beanstalk is employed for deployment

## 1.7 Constraints

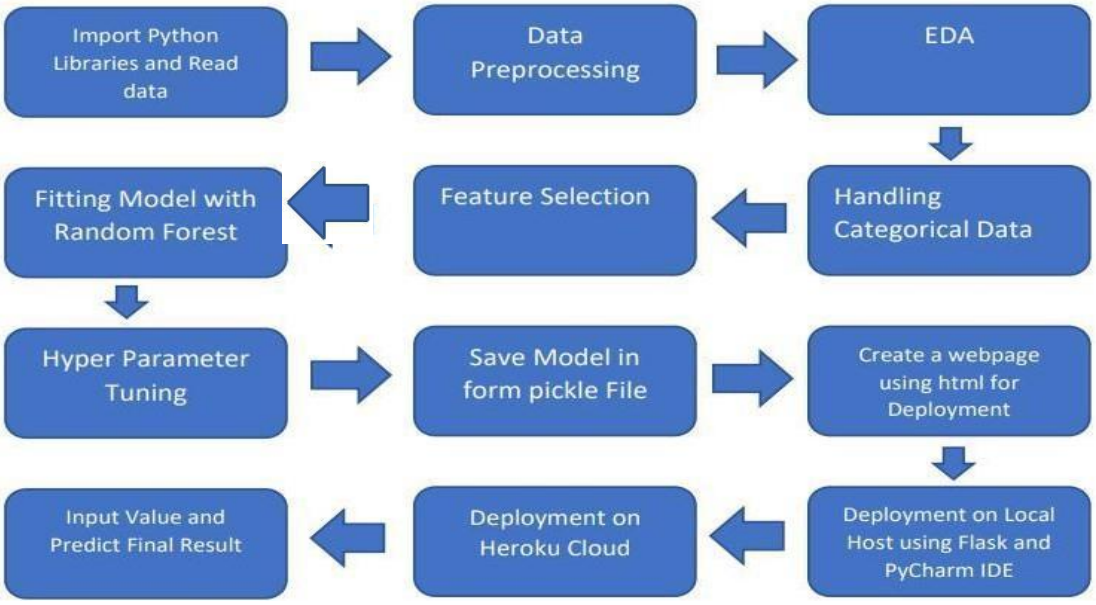
The flight fare prediction system should be designed for ease of use, with as much automation as possible, and users should not need to have any understanding of its underlying operations.

## 1.8 Assumptions

The primary objective of the project is to apply utilization scenarios to the new dataset provided by the user through the program. A machine learning model is utilized to process the data from the computer files. Additionally, it is assumed that all components of the project will integrate effectively according to the designer's expectations.

# High Level Design (HLD)

## 2.1 and 2.2 Design Flow and Deployment Process




## 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 a slip has occurred, the reason is logged in its several log files, in order that the developer will rectify the error.

## 3 Performance analysis

### 3.1 Reusability

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

### 3.2 Application Compatibility

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

## 3.4 Deployment

The model is being deployed on Aws elastic beanstalk.

## Conclusion

The Mushroom Classification model is engineered to assess whether a mushroom is safe to eat or toxic by analyzing the data utilized in training the algorithm. This allows for early detection and swift measures to avoid consumption.