Architecture

MUSHROOM CLASSIFICATION

Revision Number – 1.0

Last Date of Revision – 30-08-2023

SAEED SHAIKH

Libraries Requirement

Flask
flask_cors
pandas
numpy
scikit-learn
seaborn

Contents

Abstract

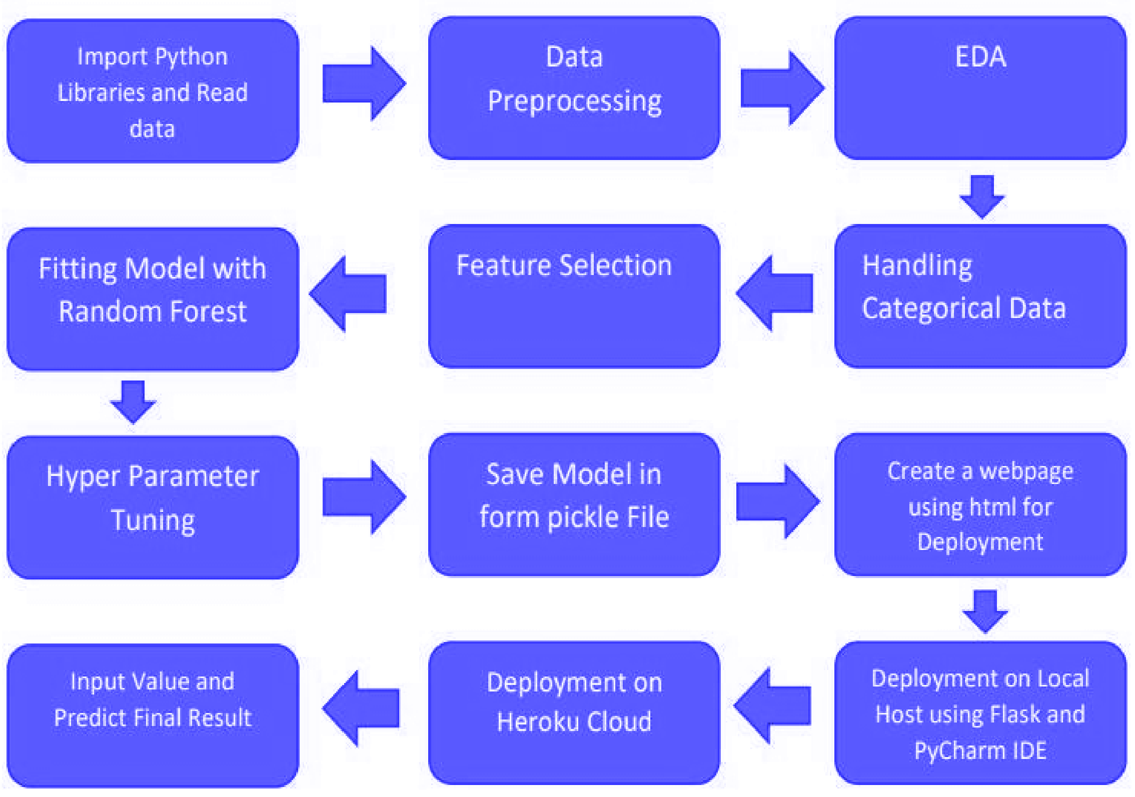
Mushrooms are a diverse group of fungi that play significant roles in various ecosystems and hold culinary and medicinal importance. However, the distinction between edible and poisonous mushrooms can be challenging due to their visual similarity. In this project, we propose a comprehensive approach to mushroom classification utilizing machine learning techniques. Our primary objective is to develop an accurate and reliable system capable of distinguishing between different mushroom species, particularly focusing on distinguishing toxic from non-toxic varieties.

Introduction

Why this Architecture Design documentation?

The main objective of the Architecture design documentation is to provide the internal logic understanding of the flight fare prediction code. The Architecture design documentation is designed in such a way that the programmer can directly code after reading each module description in the documentation.

1 Architecture


Import Python Libraries and Read data
Data Preprocessing
EDA
Handling Categorical Data
Feature Selection
Fitting Model with Random Forest
Hyper Parameter Tuning
Save Model in form pickle File
Create a webpage using html for Deployment
Deployment on Local Host using Flask and PyCharm IDE
Deployment on Heroku Cloud
Input Value and Predict Final Result

2 Architecture design

This project is to create an interface for the user to know if a mushroom is edible or toxic, in addition to this, in need of getting the real time project experience we are importing the gathered data into our own database and then starting the project from scratch.

2.1 Data gathering from main source

The data for the current project is being gathered from Kaggle dataset, the link to the data is: https://www.kaggle.com/datasets/uciml/mushroom-classification

2.2 Data description

Mushroom dataset is the biggest publicly available dataset. This dataset contains 8314 rows and 23 columns.

2.3 Export data from database

In the above created api, the download url is also being created, which downloads the data into a csv file format.

2.4 Data pre-processing

Steps performed in pre-processing are:

- First the data types are being checked and found only the price column is of type integer.
- Checked for null values as there are few null values, those rows are dropped.
- Converted all the required column into the date time format.
- Performed one-hot encoding for the required columns.
- Scaling is performed for required data.
- And, the data is ready for passing to the machine learning algorithm.

2.5 Modelling

The pre-processed data is then visualized and all the required insights are being drawn. Although from the drawn insights, the data is randomly spread but still modelling is performed with different machine learning algorithms to make sure we cover all the possibilities. **Gradient Boosting classifier** performed well and further hyperparameter tuning is done to increase the model's accuracy.

2.6 UI integration

Both CSS and HTML files are being created and are being integrated with the created machine learning model. All the required files are then integrated to the app.py file and tested locally. Note I did not make the CSS and HTML File .

2.7 Data from user

The data from the user is retrieved from the created HTML web page.

2.8 Data validation

The data provided by the user is then being processed by app.py file and validated. The validated data is then sent for the prediction.

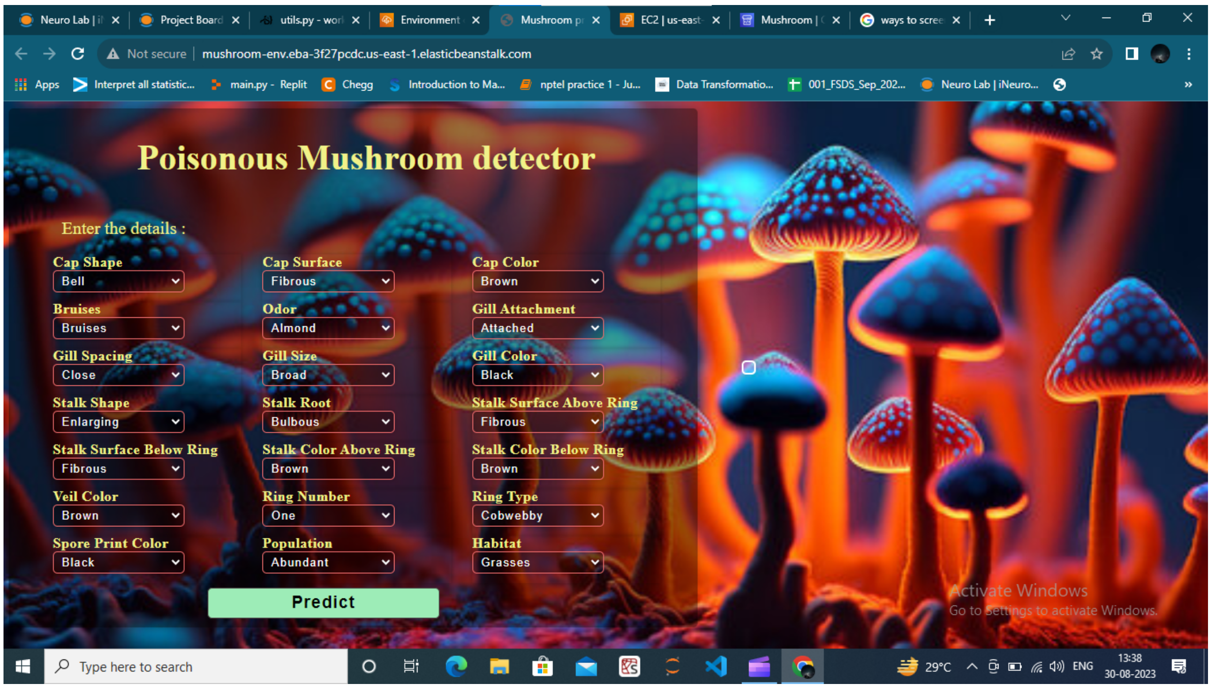
2.9 Rendering the results

The data sent for the prediction is then rendered to the web page.

2.10 Deployment

The tested model is then deployed to AWS ELASTIC BEANSTALK . So, users can access the project from any internet devices.

ScreenShot of the App Interface which I have deployed

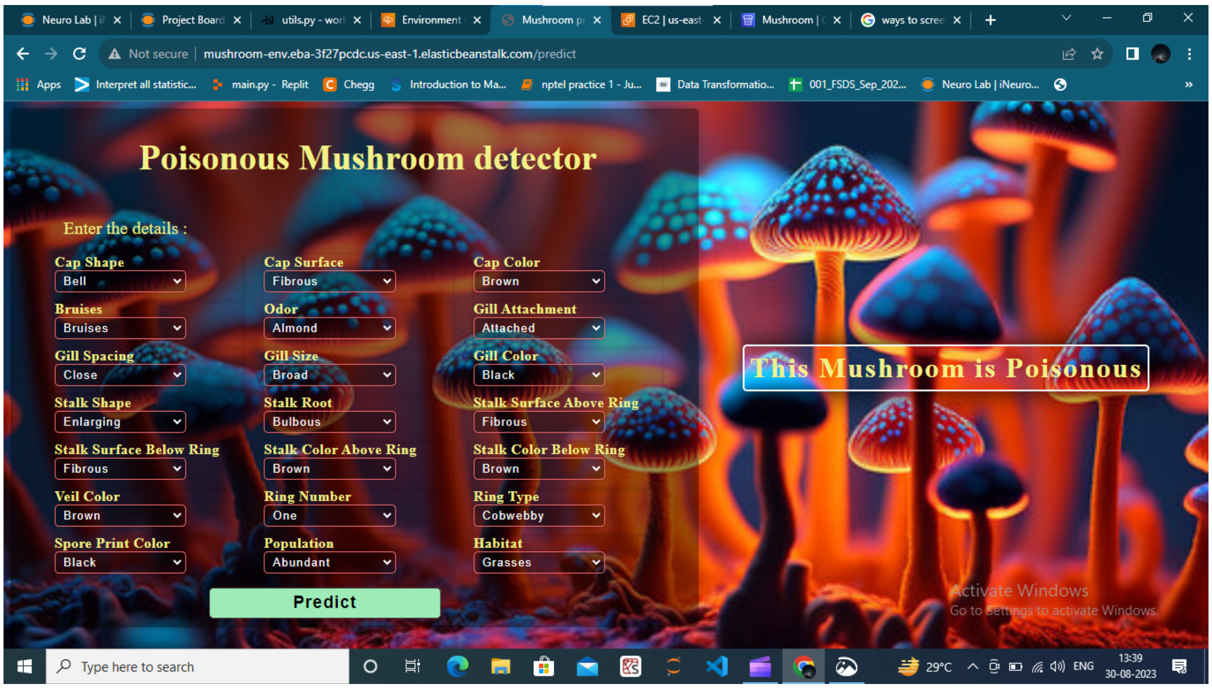

Not secure | mushroom-env.eba-3f27pcdc.us-east-1.elasticbeanstalk.com
Activate Windows
Go to Settings to activate Windows.
Type here to search
29°C
13:38
30-08-2023

Poisonous Mushroom detector

Enter the details :

Cap Shape: Bell	Cap Surface: Fibrous	Cap Color: Brown
Bruises: Bruises	Odor: Almond	Gill Attachment: Attached
Gill Spacing: Close	Gill Size: Broad	Gill Color: Black
Stalk Shape: Enlarging	Stalk Root: Bulbous	Stalk Surface Above Ring: Fibrous
Stalk Surface Below Ring: Fibrous	Stalk Color Above Ring: Brown	Stalk Color Below Ring: Brown
Veil Color: Brown	Ring Number: One	Ring Type: Cobwebby
Spore Print Color: Black	Population: Abundant	Habitat: Grasses

Predict


Not secure | mushroom-env.eba-3f27pcdc.us-east-1.elasticbeanstalk.com/predict
Activate Windows
Go to Settings to activate Windows.
Type here to search
29°C
13:39
30-08-2023

Poisonous Mushroom detector

Enter the details :

Cap Shape: Bell	Cap Surface: Fibrous	Cap Color: Brown
Bruises: Bruises	Odor: Almond	Gill Attachment: Attached
Gill Spacing: Close	Gill Size: Broad	Gill Color: Black
Stalk Shape: Enlarging	Stalk Root: Bulbous	Stalk Surface Above Ring: Fibrous
Stalk Surface Below Ring: Fibrous	Stalk Color Above Ring: Brown	Stalk Color Below Ring: Brown
Veil Color: Brown	Ring Number: One	Ring Type: Cobwebby
Spore Print Color: Black	Population: Abundant	Habitat: Grasses

Predict

This Mushroom is Poisonous