PW SKILLS

MUSHROOM CLASSIFICATION REPORT

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❖ Abstract

This research investigates the application of machine learning for classifying mushrooms. Conventional approaches are labor-intensive and demand specialized knowledge. The researchers assembled a dataset of mushroom specimens, labeled them by class, and employed feature extraction methods. Different machine learning models were trained and assessed, showing superior accuracy over traditional techniques. The findings underscore the potential for automated mushroom identification and quality assurance in the food industry.

❖ Objective:

- ➢ **Creation of a predictive model for classifying mushrooms to assess their edibility and identify whether they are safe to eat or toxic.**

❖ Benefits:

- ➢ **Detection of upcoming poisonous mushrooms.**
- ➢ **Gives better insight of edible mushrooms.**
- ➢ **Detection of upcoming poisonous mushrooms.**

❖ Data Description

cap-shape: bell=b,conical=c,convex=x,flat=f, knobbed=k,sunken=s

cap-surface: fibrous=f,grooves=g,scaly=y,smooth=s

cap-color: brown=n,buff=b,cinnamon=c,gray=g,green=r,pink=p,purple=u,red=e,white=w,yellow=y

bruises: bruises=t,no=f

odor: almond=a,anise=l,creosote=c,fishy=y,foul=f,musty=m,none=n,pungent=p,spicy=s

gill-attachment: attached=a,descending=d,free=f,notched=n

gill-spacing: close=c,crowded=w,distant=d

gill-size: broad=b,narrow=n

gill-color: black=k,brown=n,buff=b,chocolate=h,gray=g,
green=r,orange=o,pink=p,purple=u,red=e,white=w,yellow=y

talk-shape: enlarging=e,tapering=t

stalk-root: bulbous=b,club=c,cup=u,equal=e,rhizomorphs=z,rooted=r,missing=?

Stalk-surface-above-ring: fibrous=f,scaly=y,silky=k,smooth=s

stalk-surface-below-ring: fibrous=f,scaly=y,silky=k,smooth=s

stalk-color-above-ring:brown=n,buff=b,cinnamon=c,gray=g,orange=o,pink=p,red=e,white=w,y
ellow=y

stalk-color-below-ring:
brown=n,buff=b,cinnamon=c,gray=g,orange=o,pink=p,red=e,white=w,yellow=y

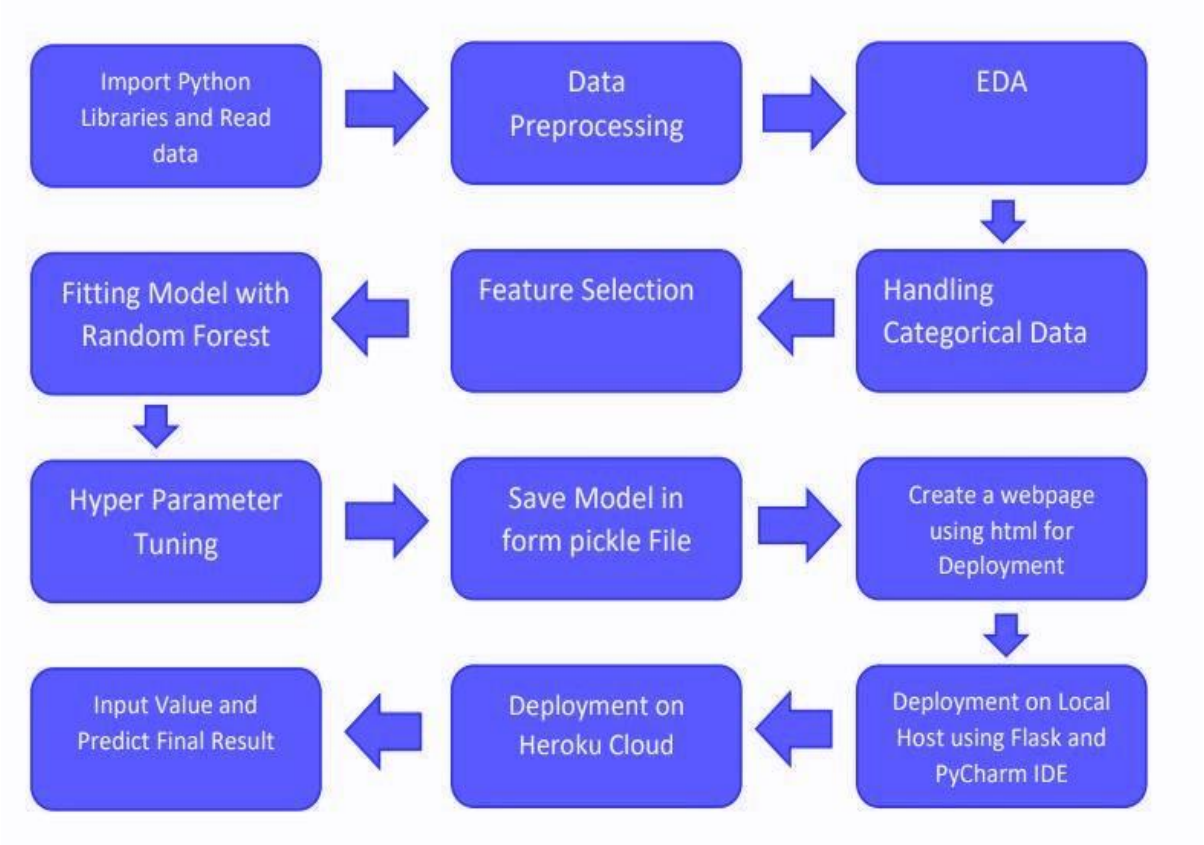
veil-color: brown=n,orange=o,white=w,yellow=y
ing-number: none=n,one=o,two=t

ring-type: cobwebby=c,evanescent=e,flaring=f,large=l,none=n,pendant=p,sheathing=s,zone=z

spore-print-color:
black=k,brown=n,buff=b,chocolate=h,green=r,orange=o,purple=u,white=w,yellow=y

population: abundant=a,clustered=c,numerous=n,scattered=s,several=v,solitary=y

❖ ARCHITECTURE



❖ Model Training:

- ➢ Data Preprocessing o Performing EDA to get insight of data like identifying distribution , outliers, trend among data etc.
- ➢ Check for null values in the columns. If present impute the null values.
- ➢ Encode the categorical values with numeric values.
- ➢ Perform Standard Scalar to scale down the values.

❖ Feature Selection:

- ➢ Use feature selection techniques Relevant information as possible. This helps to simplify the classification task and avoid overfitting.

❖ Model Selection:

- **Evaluates classification models using Logistic Regression ,Random forest , Decision Tree , through exhaustive Random search, and Area Under Curve (AUC) & F1 score.**

- **Compute metrics and generate graphs for model evaluation and importance analysis.**

- **We view AUC and F1 score values for each model and found out the Gradient boosting classifier perform well**

- **Finally, we fit the Gradient Boosting Classifier model with optimal tuning parameters on the entire dataset. We then could use this model to predict whether Mushroom is edible or Poisonous .**

- **Prediction :**

  - The testing file is used and we perform the same validation operations, data transformation and data insertion on them.

  - The accumulated data from database is exported in csv format for prediction.

  - We perform data pre-processing techniques in it.

- **Deployment :**

  - We have deployed the application on AWS elastic beanstalk.