

Data Collection and Preprocessing Phase

Date	10/07/2024
Team ID	team-739866
Project Title	Revolutionizing Liver care : Predicting Liver cirrhosis using Advanced machine learning Techniques
Maximum Marks	6 Marks

Data Exploration and Preprocessing Template

The images will be preprocessed by resizing, normalizing, augmenting, denoising, adjusting contrast, detecting edges, converting color space, cropping, batch normalizing, and whitening data. These steps will enhance data quality, promote model generalization, and improve convergence during neural network training, ensuring robust and efficient performance across various computer vision tasks.

Section	Description
Data Overview	There are many popular open sources for collecting the data. Eg: kaggle.com, UCI repository, etc. In this project we have used .csv data
Data Preparation	These are the general steps of pre-processing the data before using it for machine learning
Handling missing values	We use Handling missing values For checking the null values
Handling categorical data	As we can see our dataset has categorical data we must convert the categorical data to integer encoding or binary encoding
Handling Outliers in Data	With the help of boxplot, outliers are visualized. And here we are going to find upper bound and lower bound of numerical features with some mathematical formula

Data Preprocessing Code Screenshots

Collect the dataset

Please refer to the link given below to download the dataset.
link: [liver cirrhosis prediction \(kaggle.com\)](https://www.kaggle.com/datasets/verandaa/liver-cirrhosis-prediction)

Importing the libraries

```
import matplotlib.pyplot as plt
import pandas as pd
import seaborn as sns
import pickle as pkl
import numpy as np
from sklearn import svm
from sklearn.model_selection import train_test_split
from sklearn.neighbors import KNeighborsClassifier
from sklearn.ensemble import RandomForestClassifier
from sklearn.linear_model import LogisticRegression, LogisticRegressionCV, RidgeClassifier
from sklearn.model_selection import train_test_split, GridSearchCV
from xgboost import XGBClassifier
from sklearn.preprocessing import Normalizer
from sklearn.metrics import accuracy_score, f1_score, recall_score, precision_score
```

Loading Data

We use the code
`df=pd.read_csv("/content/HealthCare.csv")`
For reading the dataset

Handling missing values

```
df.isnull().sum()

S.NO      0
Age        0
Gender     0
Place(location where the patient lives)    134
Duration of alcohol consumption(years)     0
Quantity of alcohol consumption (quarters/day)  0
Type of alcohol consumed                   0
Hepatitis B infection                      0
Hepatitis C infection                      0
Diabetes Result                           0
Blood pressure (mmhg)                     0
Obesity                                    0
Family history of cirrhosis/ hereditary    0
TCH                                          359
TG                                           359
LDL                                          359
HDL                                          368
Hemoglobin (g/dl)                          0
PCV (%)                                    30
```

Handling Categorical values

```
categorical_features = df.select_dtypes(include=[np.object])
categorical_features.columns
```

```
Index(['Gender', 'Place(location where the patient lives)',
      'Type of alcohol consumed', 'Hepatitis B infection',
      'Hepatitis C infection', 'Diabetes Result', 'Blood pressure',
      'Obesity', 'Family history of cirrhosis/ hereditary', 'TG',
      'Total Bilirubin (mg/dl)', 'A/G Ratio',
      'USG Abdomen (diffuse liver or not)', 'Outcome'],
      dtype='object')
```

Handling Outliers

```
c=0
plt.figure(figsize=(20,15))
for i in df.columns:
    if type(df[i][0])!=str:
        plt.subplot(7,5,c+1)
        sns.boxplot(df[i])
        plt.title(i)
        c+=1
plt.show()
```

