PREDICTING HEART DISEASE

using KNN-algorithm

The goal of applying the KNN-Classification alg to the dataset is to predict whether an individual is at risk of heart disease based on various characteristics such as age, blood pressure, cholesterol levels, etc . Therefore, we will work to solve the problem of identify factors that contribute most to heart disease risk and use them for preventive measures and predicting which patients are likely to respond well to heart disease treatments and this helps guide individual treatment plans.

.The reasons that prompted me to create the project :

1.Prevalence of heart disease

2.Support to doctors

3. Promoting health awareness

. It brings many benefits :

1. Early diagnosis

2. Anyone can use them to make an initial assessment of heart disease risk.

3. Physicians can use the findings from the model as additional evidence when evaluating patients' conditions.

. Iam choose the KNN-classification alg because it simplest to understand , easy implement ,effective in predicting classification outputs,Strong performance and flexible .

. How to run the code :

Open jupyter then load the dataset and run all cells .You show the GUL .Input your level values of age and cholesterol etc then enter on predict button It will show you the result if No-0 predict heart disease or yes-1 ! It's crucial to consult a doctor for further evaluation !

. Explain the code :

. Import the libraries :pandas,numpy, matplotlib, sklearn, tkinter.

. Import the dataset : dataset_url = r"C:\heart_ds\heart.csv"

X = dataset_df.iloc[:, :-1].values

y = dataset_df.iloc[:, -1].values

. Splitting the dataset into the training set and test set :

```
X_train, X_test, y_train, y_test = train_test_split( X, y, test_size = 0.2 , random_state = 0 )
```

. Feature scaling :

```
from sklearn.preprocessing import StandardScaler
sc = StandardScaler()
X_train = sc.fit_transform(X_train)
X_test = sc.transform(X_test)
```

. Training KNN model on the training set :

```
from sklearn.neighbors import KNeighborsClassifier
knn = KNeighborsClassifier(n_neighbors=2 , metric = 'minkowski', p = 2)
knn.fit(X_train, y_train)
```

. Making the Confusion Matrix :

```
from sklearn.metrics import confusion_matrix, accuracy_score
cm = confusion_matrix(y_test, y_pred)
print(cm)
accuracy_score(y_test, y_pred)
```

----> the result of accuracy is 0.99

. Create GUL :

By use TKinter library and identify the characteristics of window

```
root = Tk()

root.title(' KNN-Classification Heart Disease ')

root.config(background="#66b3ff")

button_color = "#66b3ff"

root.resizable(True, True)

root.minsize(width=600, height=400)

root.maxsize(width=1000, height=600) ....
```

One of the improvements on project I am thinking about in the future is specific exactly what the problem name in heart disease and enhancement on GUL to be more beautiful Additionally integrated KNN-model into medical decision support systems to provide physicians with risk assessments and patient recommendations as well as experience different models like SVM, Random Forest, Logistic Regression and performance comparison finally use the data visualization.

A classification model based on the Closest Neighbors (KNN) algorithm has been developed to predict the presence of heart disease based on a set of data. It includes an interactive user interface using the Tkinter library, making it easy for users to enter data and get predictions easily. High prediction accuracy achieved thanks to data preprocessing. This project shows the importance of applying machine learning techniques in the medical field as these tools can contribute to improving the accuracy of medical diagnoses and reducing the time it takes to make clinical decisions Thanks to the interactive interface, doctors and patients can use the form to obtain preliminary estimates on the risk of heart disease. This promotes health awareness and helps in taking early preventive action.

. References :

.Kaggle - dataset

.The chapters and KNN implementation on Moodle

. National Electronic Library of Medicine

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