Project - Machine Learning

Prediction Of Fracture Or Not

In this project, we will work with Fracture.csv dataset to develop a machine learning algorithm that predicts the fracture. A model like this would be very valuable to predict one‟s fracture using id,age,weight,,height and bmd

4.1 Problem Statement

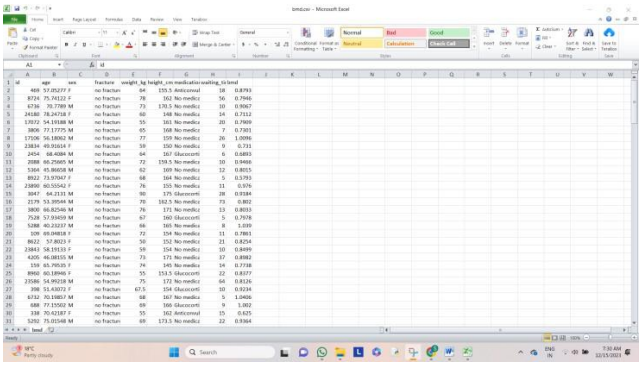
Develop a model that has the capacity of predicting fracture by making use of the information provided in fracture Dataset

4.2 Dataset

The dataset used in this project consists of 8 variables: „Gender‟, 'Height', 'Weight', 'Index',‟BMD‟,‟Medication‟,‟Waiting Time‟ and „Age‟.The main variable we are interested is 'fracture‟. This variable predicts the fracture of the person based on the inputs given in dataset

1. **ID** Enter the id number
2. **Age** Enter the age
3. **Sex** Enter the gender
4. **Weight** Enter the weight
5. **Height** Enter the height
6. **Waiting time** Enter the waiting time
7. **BMD** Enter the bmd

The overview of the original dataset is shown in figure with its original features:



4.3 Algorithm –Navie Bayes Algorithm

It is a very simple python program to implement. Multiple regression is like linear regression, but with more than one independent value, meaning that we try to predict a value based on two or more variables. Navie Bayes algoritnm is implemented using the GussianNB class from sklearn.linear_model library.

4.4 Programming Steps

•This project requires us to predict the weight of a person based on the given input dataset.

•First, we read the given dataset using pandas function.

•Then we print the inputs and output from csv file.

•Label encoding is used for „Sex‟ and „Medication‟ column.

•We initialize the model i.e., Navie Bayes Algorithm.

•We further implement this using Django in order for better representation

Code:

```
import pandas as pd

path="C:\\Users\\Sakshi\\Desktop\\Machine Learning\\Data\\Data\\bmd.csv"

data=pd.read_csv(path)

print(data)

print(data.info())


data['sex']=data['sex'].map({'M':1,'F':0})

print(data)


data['medication']=data['medication'].map({'Anticonvulsant':1,'No
medication':2,'Glucocorticoids':3})

print(data)


#data['fracture']=data['fracture'].map({'fracture':1,'no fracture':0})

#print(data)
```

```
inputs=data.drop('fracture','columns')

output=data.drop(['id','age','sex','weight_kg','height_cm','medication','waiting_time','bmd'],'col
umns')


import sklearn

from sklearn.model_selection import train_test_split

x_train,x_test,y_train,y_test=train_test_split(inputs,output,train_size=0.8)

print(x_train)

print(x_test)

print(y_train)

print(y_test)


from sklearn.naive_bayes import GaussianNB

model=GaussianNB()

model.fit(x_train,y_train)

y_pred=model.predict(x_test)

print(y_pred)

print(y_test)

pclass=int(input("Enter the id of the person:"))

age=float(input("Enter the age of the person:"))

sex=int(input("Enter the sex 0--F 1--M:"))

weight_kg=int(input("Enter the weight of the person in kg's:"))

height_cm=float(input("Enter the height of the person in cm's:"))

medication=int(input("Enter the medication 1--Anticonvulsant 2--No medication 3--
Glucocorticoids:"))

waiting_time=int(input("Enter the waiting time:"))
```

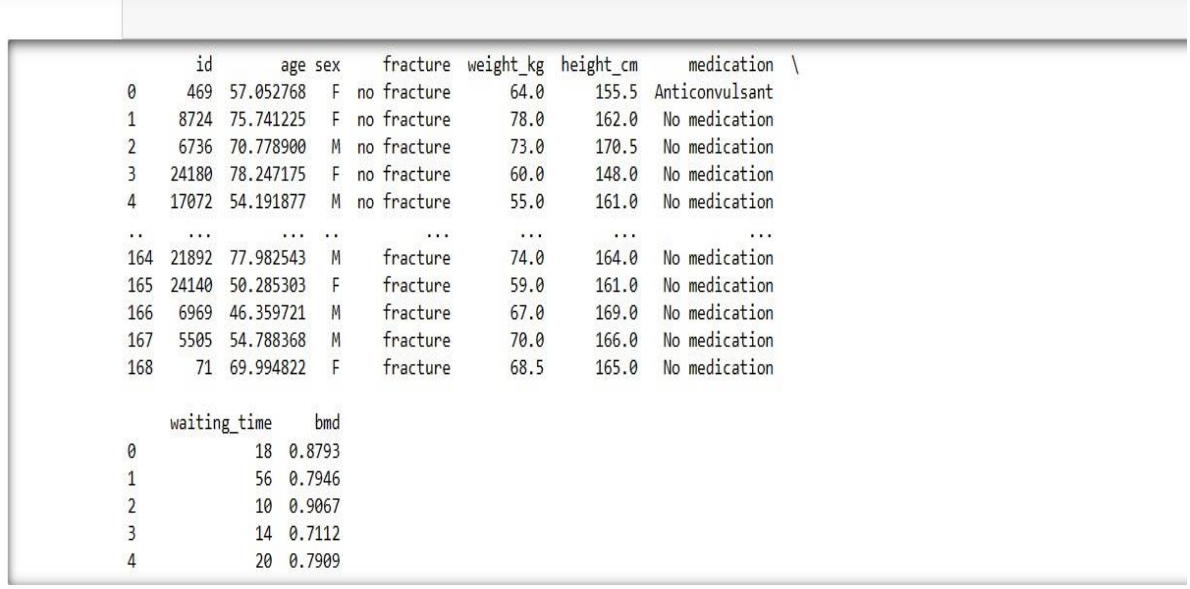
```
bmd=float(input("Enter the bmd:"))


result=model.predict([[pclass,age,sex,weight_kg,height_cm,medication,waiting_time,bmd]])
print(result)



if result==1:
    print("The person have Fracture")
else:
    print("The person have no fracture")
import seaborn as sns
import matplotlib.pyplot as plt
sns.countplot(data.fracture)
plt.show()
```

OUTPUT:



	id	age	sex	fracture	weight_kg	height_cm	medication	waiting_time	bmd
0	469	57.052768	F	no fracture	64.0	155.5	Anticonvulsant	18	0.8793
1	8724	75.741225	F	no fracture	78.0	162.0	No medication	56	0.7946
2	6736	70.778900	M	no fracture	73.0	170.5	No medication	10	0.9067
3	24180	78.247175	F	no fracture	60.0	148.0	No medication	14	0.7112
4	17072	54.191877	M	no fracture	55.0	161.0	No medication	20	0.7909
..	...	...	..	...	...	...	...	...	...
164	21892	77.982543	M	fracture	74.0	164.0	No medication		
165	24140	50.285303	F	fracture	59.0	161.0	No medication		
166	6969	46.359721	M	fracture	67.0	169.0	No medication		
167	5505	54.788368	M	fracture	70.0	166.0	No medication		
168	71	69.994822	F	fracture	68.5	165.0	No medication		

```
Enter the id of the person:582
Enter the age of the person:56.42
Enter the sex 0--F 1--M:1
Enter the weight of the person in kg's:23
Enter the height of the person in cm's:12.36
Enter the medication 1--Anticonvulsant 2--No medication 3--Glucocorticoids:2
Enter the waiting time:23
Enter the bmd:0.159
[1]
```