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Project: HealthCare ChatBot

#using the concept of decision-tree

```
import pandas as pd
import numpy as np
import random
from sklearn import preprocessing
from sklearn.tree import DecisionTreeClassifier, _tree
from sklearn.cross_validation import train_test_split
from sklearn import cross_validation
#for ignoring the warnings
import warnings
warnings.filterwarnings("ignore", category=DeprecationWarning)
import matplotlib.pyplot as plt

# Importing the dataset
training = pd.read_csv('Training.csv')
testing = pd.read_csv('Testing.csv')
# saving the information of columns
cols = training.columns
cols = cols[:-1]
# Slicing and Dicing the dataset to separate features from predictions
x = training[cols]
y = training['prognosis']
y1 = y

# dimensionality Reduction for removing redundancies
reduced_data = training.groupby(training['prognosis']).max()

# encoding/mapping String values to integer constants
le = preprocessing.LabelEncoder()
le.fit(y)
y = le.transform(y)

# Splitting-the-dataset-into-training-set-and-test set
x_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.33, random_state=42)
# print(x_test)
testx = testing[cols]
testy = testing['prognosis']
testy = le.transform(testy)
#greetings
GREETING_INPUTS = ("hello", "hi", "greetings", "sup", "what's up", "hey",)
```

```
GREETING_RESPONSES = ["hi", "hey", "*nods*", "hi there", "hello", "I am glad! You are talking to me"]
```

```
#implement the Decision-Tree-Classfier
```

```
clf1 = DecisionTreeClassifier()
```

```
clf = clf1.fit(x_train,y_train)
```

```
# checking the Important features
```

```
importances = clf.feature_importances_
```

```
indices = np.argsort(importances)[::-1]
```

```
features = cols
```

```
def greeting(sentence):
```

```
    """If user's input is a greeting, return a greeting response"""
```

```
    for word in sentence.split():
```

```
        if word.lower() in GREETING_INPUTS:
```

```
            return random.choice(GREETING_RESPONSES)
```

```
def print_disease(node):
```

```
    node = node[0]
```

```
    val = node.nonzero()
```

```
    disease = le.inverse_transform(val[0])
```

```
    return disease
```

```
def tree_to_code(tree, feature_names):
```

```
    tree_ = tree.tree_
```

```
    feature_name = [
```

```
        feature_names[i] if i != _tree.TREE_UNDEFINED else "undefined!"
```

```
        for i in tree_.feature
```

```
    ]
```

```
    symptoms_present = []
```

```
    def recurse(node, depth):
```

```
        indent = " " * depth
```

```
        if tree_.feature[node] != _tree.TREE_UNDEFINED:
```

```
            name = feature_name[node] #storing disease name from the file
```

```
            threshold = tree_.threshold[node]
```

```
#         print(threshold)
```

```
        print("Healtho: " + name + " ?")
```

```
        ans = input()
```

```
        ans = ans.lower()
```

```
        if ans == 'yes':
```

```
            val = 1
```

```
        elif ans == 'no':
```

```
            val = 0
```

```
        else:
```

```
            print("Healtho: I am sorry! I don't understand you")
```

```
            val = 0
```

```
        if val <= threshold:
```

```

        recurse(tree_.children_left[node], depth + 1)
    else:
        symptoms_present.append(name)
        recurse(tree_.children_right[node], depth + 1)
    else:

        present_disease = print_disease(tree_.value[node])
        for di in present_disease:
            diss=di
        for i in symptoms_present:
            dis=i
        print( "Healtho: You may have " +diss)
        red_cols = reduced_data.columns
        symptoms_given = red_cols[reduced_data.loc[present_disease].values[0].nonzero()]
        print("Healtho: symptoms present " +dis)
        indexx=np.arange(1,len(symptoms_given)+1)
        data=pd.DataFrame(list(symptoms_given),index=[indexx],columns=['OTHER
SYMPTOMS'])
        print(data)
        import csv
        f=open('doc_consult.csv','r')
        read=csv.reader(f)
        consult={}
        consult_doc=[' YES','NO']

        for row in read:
            consult[row[0]]=int(row[1]) #converting csv to dictionary
        if(consult[diss]>50):
            print("Healtho: You should consult a doctor as soon as possible")
            data1=[consult[diss],0]
            plt.ylim([0,100])
            plt.bar(consult_doc,data1,align='center',color='red',width=0.15)
            plt.ylabel('Risk')
            plt.xlabel('Consult a doctor')
            plt.show()

        else:
            print("Healtho: You may consult a doctor")
            data1=[0,consult[diss]]
            plt.ylim([0,100])
            plt.bar(consult_doc,data1,align='center',color='red',width=0.15)
            plt.ylabel('Risk')
            plt.xlabel('Consult a doctor')
            plt.show()

recurse(0, 1)

```

```
flag=True
print("Healtho: My name is Healtho. I will answer your queries about your health related
problem. If you want to exit, type Bye!")
while(flag==True):

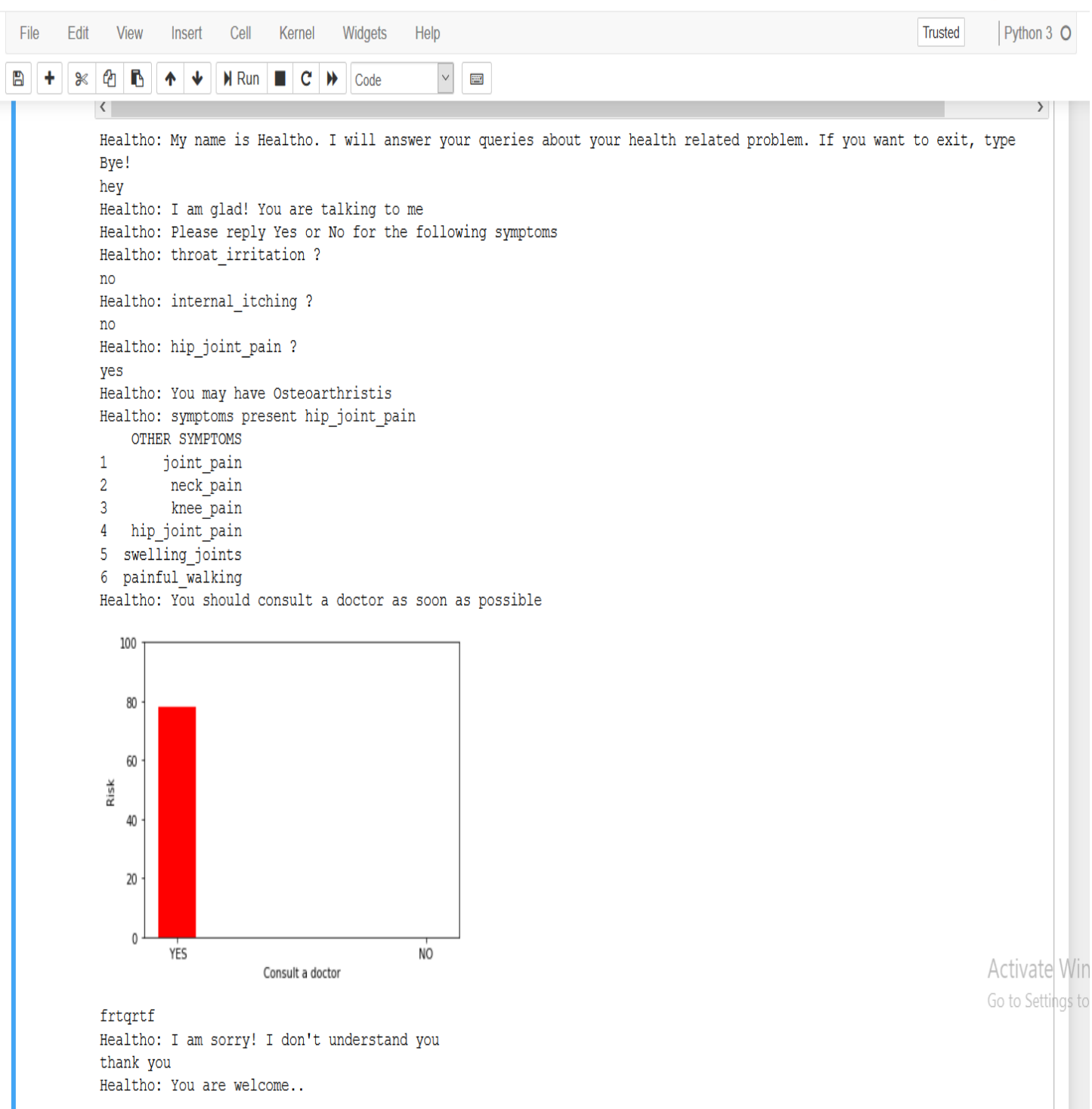
    user_response=input()
    user_response=user_response.lower()

    if(user_response!='bye'):
        if(user_response=='thanks' or user_response=='thank you' ):
            flag=False
            print("Healtho: You are welcome..")

        else:
            if(greeting(user_response)!=None):
                print("Healtho: "+greeting(user_response))
                print("Healtho: Please reply Yes or No for the following symptoms")
                tree_to_code(clf,cols)
            else:
                print("Healtho: I am sorry! I don't understand you")
                flag=True

    else:
        flag=False
        print("Healtho: Bye! take care..")
```

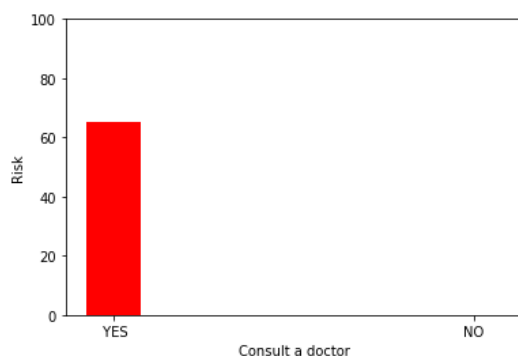
OUTPUTS



```

Healtho: My name is Healtho. I will answer your queries about your health related problem. If you want to exit, type Bye!
hey
Healtho: hello
Healtho: Please reply Yes or No for the following symptoms
Healtho: runny_nose ?
no
Healtho: internal_itching ?
no
Healtho: hip_joint_pain ?
no
Healtho: polyuria ?
no
Healtho: silver_like_dusting ?
no
Healtho: enlarged_thyroid ?
yes
Healtho: You may have Hypothyroidism
Healtho: symptoms present enlarged_thyroid
    OTHER SYMPTOMS
1         fatigue
2         weight_gain
3  cold_hands_and_feets
4         mood_swings
5         lethargy
6         dizziness
7  puffy_face_and_eyes
8         enlarged_thyroid
9         brittle_nails
10        swollen_extremeties
11        depression
12        irritability
13  abnormal_menstruation
Healtho: You should consult a doctor as soon as possible

```

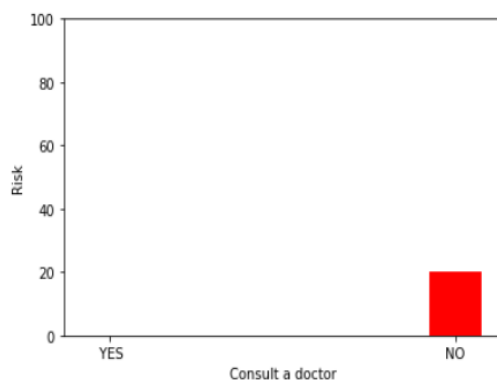


```

bye
Healtho: Bye! take care..

```

```
Healtho: My name is Healtho. I will answer your queries about your health related problem. If you want to exit, type
Bye!
greetings
Healtho: I am glad! You are talking to me
Healtho: Please reply Yes or No for the following symptoms
Healtho: redness_of_eyes ?
yes
Healtho: You may have Common Cold
Healtho: symptoms present redness_of_eyes
OTHER SYMPTOMS
1 continuous_sneezing
2 chills
3 fatigue
4 cough
5 high_fever
6 headache
7 swelled_lymph_nodes
8 malaise
9 phlegm
10 throat_irritation
11 redness_of_eyes
12 sinus_pressure
13 runny_nose
14 congestion
15 chest_pain
16 loss_of_smell
17 muscle_pain
Healtho: You may consult a doctor
```



```
thank you
Healtho: You are welcome..
```