```python
import nltk
import numpy as np
import random
import string # to process standard python strings
f=open('chatty.txt','r')
raw=f.read()
raw=raw.lower()
nltk.download('punkt')
nltk.download('wordnet')
sent_tokens = nltk.sent_tokenize(raw)
word_tokens = nltk.word_tokenize(raw)
sent_tokens[:2]
['a chatty (also known as a bot, im bot, intelligent agent, or artificial
conversational entity) is a computer program or an artificial
intelligence which conducts a conversation via auditory or textual
methods.',
 'such programs are often designed to convincingly simulate how a human
would behave as a conversational companion, thereby passing the turing
test.']
word_tokens[:2]
['a', 'chatty', '(', 'also', 'known']
lemmer = nltk.stem.WordNetLemmatizer()
#WordNet is a semantically-oriented dictionary of English included in
NLTK.
def LemTokens(tokens):
    return [lemmer.lemmatize(token) for token in tokens]
remove_punct_dict = dict((ord(punct), None) for punct in
string.punctuation)
def LemNormalize(text):
    return
LemTokens(nltk.word_tokenize(text.lower().translate(remove_punct_dict)))

GREETING_INPUTS = ("hello", "greetings", "sup",)
GREETING_RESPONSES = ["hey", "*nods*", "I am glad! You are talking to
me"]
def greeting(sentence):

    for word in sentence.split():
        if word.lower() in GREETING_INPUTS:
            return random.choice(GREETING_RESPONSES)
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.metrics.pairwise import cosine_similarity
def response(user_response):
    KELLY_response=''
    TfidfVec = TfidfVectorizer(tokenizer=LemNormalize,
stop_words='english')
    tfidf = TfidfVec.fit_transform(sent_tokens)
    vals = cosine_similarity(tfidf[-1], tfidf)
    idx=vals.argsort()[0][-2]
    flat = vals.flatten()
    flat.sort()
    req_tfidf = flat[-2]
    if(req_tfidf==0):
        KELLY_response=KELLY_response+"I am sorry! I don't understand
you"
        return KELLY_response
    else:
        KELLY_response = KELLY_response+sent_tokens[idx]
        return KELLY_response
```

```python
flag=True
print("KELLY: My name is KELLY. I will answer your queries about Chatty.
If you want to go out, 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("KELLY: You are welcome..")
        else:
            if(greeting(user_response)!=None):
                print("KELLY: "+greeting(user_response))
            else:
                sent_tokens.append(user_response)
                word_tokens=word_tokens+nltk.word_tokenize(user_response)
                final_words=list(set(word_tokens))
                print("KELLY: ",end)
                print(response(user_response))
                sent_tokens.remove(user_response)
    else:
        flag=False
        print("KELLY: Bye! take care..")
#saurabhm99
```