Lab7 CTF Writeup

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Question 1. GO!! Chase the free wave!

[-] Hackergame 2021 challenge "去吧! 迫寻自由的电波"

[+] Inspired by Hackergame. Original created challenge.

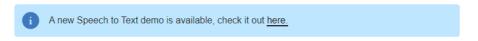
[an interesting story]

OK now you have this mp3 file, please find the flag.

video.mp3

Answer

With help of the hint, I use software Adobe Audition to slowdown and reverse the mp3 file. But no matter how I slow down it, I cannot understand the meaning of this mp3. As a result, I use the website to translate it. Then I receive a funny result:

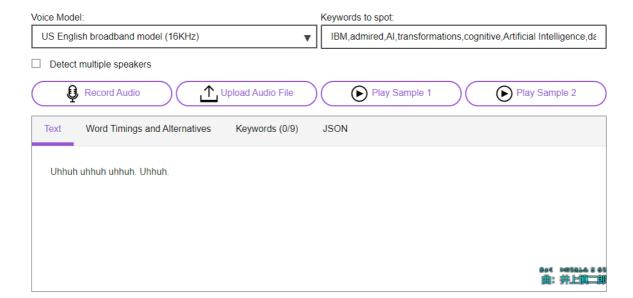


Transcribe Audio

- Use your microphone to record audio. For best results, use broadband models for microphone input.
- Upload pre-recorded audio (.mp3, .mpeg, .wav, .flac, or .opus only).
- · Play one of the sample audio files.*

*Both US English broadband sample audio files are covered under the Creative Commons license.

The returned result includes the recognized text, <u>word alternatives</u>, and <u>spotted keywords</u>. Some models can <u>detect multiple speakers</u>; this may slow down performance.



HHHHH, it clearly not the flag. So, I failed to find the flag in this problem.

Question 2. Mechanical Keyboard

Have you faced the situation, that your roommate is playing games so late and the sound of mechanical keyboard is super noisy?

Meanwhile, especially you have midterm exam the next day.

You decide to record this sound and try to find some interesting key taps from your roommate.

(Account password, secret chat with girlfriend, or pxxxhub keywords...)

dist.zip

Answer

According to the hint, I try to use the online tool. But I failed, since my computer have no microphone. Also, hearing from my classmates, this tool is very slow.

So, I use the demo code to deal with this problems.

```
from scipy.io import wavfile
if __name__ == "__main__":
    samplerate, data = wavfile.read('./output.wav')
   i = 0
    countsilent = 0
    samplefound = 0
   avg = []
   start = 0
   end = 0
   avg.append([0])
   for sample in data:
        i+=1
        if sample[1]<100:
            countsilent += 1
        if countsilent > 10000 and sample[1]>100:
            countsilent = 0
            #print(str(i)+": sample found")
            start = i
            sample found = 1
        if countsilent > 8000 and samplefound==1:
            sample found = 0
            #print(str(i)+": sample ended")
            end = i
            avg[len(avg)-1]=avg[len(avg)-1]/(end-start)
            print("avg: "+str(avg[len(avg)-1]))
            avg.append([0])
        if samplefound == 1:
            avg[len(avg)-1] += sample[1]
    alphabet = "abcdefghijklmnopqr stuvwxyz"
    avg_1 = \{\}
    i = 0
```

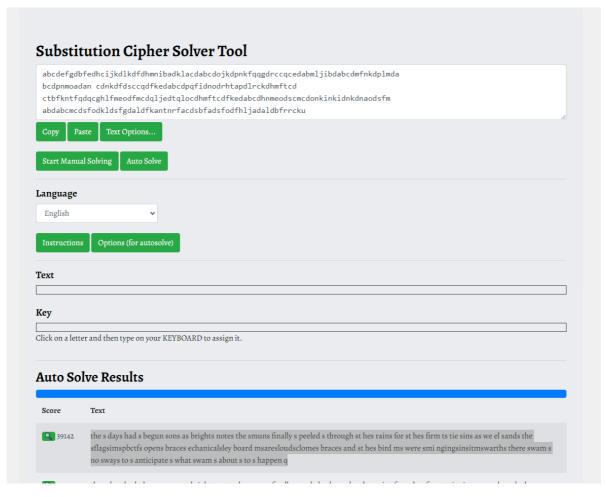
```
res = ""

for value in avg:
    if str(value) not in avg_1:
        avg_1[str(value)] = alphabet[i]
        i += 1
    res += avg_1[str(value)]
print(res)
```

This is the string in this wav file.

abcdefgdbfedhcijkdlkdfdhmnibadklacdabcdojkdpnkfqqgdrccqcedabmljibdabcdmfnkdplmdabcd pnmoadan cdnkdfdsccqdfkedabcdpqfidnodrhtapdlrckdhmftcd ctbfkntfqdqcghlfmeodfmcdqljedtqlocdhmftcdfkedabcdhnmeodscmcdonkinkidnkdnaodsfm abdabcmcdsfodkldsfgdaldfkantnrfacdsbfadsfodfhljadaldbfrrcku

Use the given tool to decrypt the code.



This is what we got, still chaos.

the s days had s begun sons as brights notes the smuns finally s peeled s through st hes rains for st hes firm ts tie sins as we el sands the sflagsimspbctfs opens braces echanicalsley board msaresloudsclomes braces and st hes bird ms were smi ngingsinsitmswarths there swam s no sways to s anticipate s what swam s about s to s happen q

I found the "flags" and two "braces". Fix the mistake between them, make it look better:

mechanical_keyboards_are_loud

So, the flag is: ${\tt flag\{mechanical_keyboards_are_loud\}}\;.$