



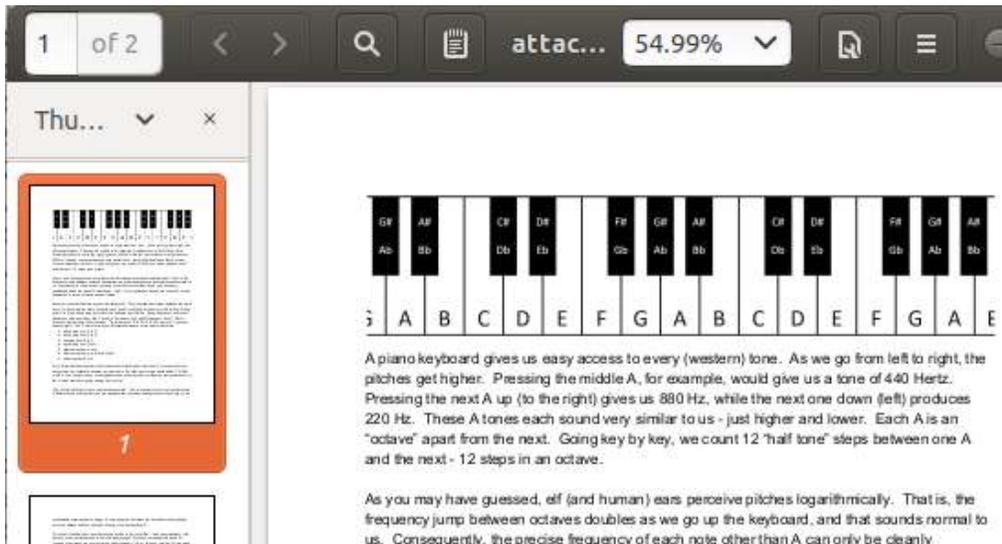


```
File Edit View Search Terminal Help
JVBERi0xLjUKJb/3ov4K0CAwIG9i ago8PCAvtGLuZWfyaXplZCAxIC9MIDk3ODMxIC9IFsgNzM4^M
IDE0MCDbIC9PIDeYIC9FIDc3MzQ0IC90IDIGL1QgOTc1MTcgPj4KZW5kb2JqCiAgICAgICAgICAg^M
ICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAg^M
ICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAg^M
VHLwZSAvWFJlZiAvTGvuZ3RoIDU5IC9GaWx0ZXIgL0ZsYXRlRGVjb2RlIC9EZWVvZGVQYXJtcyA8^M
PCAvQ29sdWlucyA1IC9QcmVkaWN0b3IgmTIgPj4gL1cgWyAxIDMgMSBdIC9JbmRleCBbIDggMjIjI^M
XSAvS5mbyAxOCaWIFIGL1Jvb3QgMTAgMCSIC9TaXplIDMwIC9QcmV2IDk3NTE4ICAgICAgICAg^M
ICAgICAgICAvSU0gWzwxM2M0MDEc3MDJiNTE1YzYwMwU5ZGQyMGYyNTJlNDlkYj48MTNjNDA3NzAy^M
YjUxNWM2MDFLOWRkMjbiMjUyZTQ5ZGI+XSA+PgpzdHJlYW0KeJxjYmRg4GdgYmBg0AKima6D2c^g^M
krEHTJ4GkettQaTACSDJmLoQrHI5AxPj/2vdYPUMjJSQAdt+cusKZW5kc3RyZWFtcmVuzG9i agoq^M
ICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAg^M
```

All those ^M characters cause problems. There is a fix. In vi, use `:%s/[cntrl-V][cntrl-M]//g`. This is similar to other Linux syntax for search and replace: `s/searchfor/replacewith/g` for global. Another way would be to use the translate command with `-d` for delete: `tr -d '\r' > file`. Both ^M and \r mean "carriage return". There's another character, \n or line feed. At the end of lines Windows uses \r\n (carriage return, line feed, or CRLF) and Linux just uses \n. I should have done it all in Linux. What a pain.

After fixing the ^M problems, it is easy to decode the file.

```
john@ubuntu:~/smtp$ vi attachment.b64.txt
john@ubuntu:~/smtp$ cat attachment.b64.txt | base64 -d > attachment
john@ubuntu:~/smtp$ file attachment
attachment: PDF document, version 1.5
john@ubuntu:~/smtp$ mv attachment attachment.pdf
john@ubuntu:~/smtp$
```



## Decoding Base64 in Windows

PowerShell can decode Base64, although the syntax is awkward. This will decode.

```
[System.Text.Encoding]::UTF8.GetString([System.Convert]::FromBase64String("U2VjcmV0TWVzc2FnZQ=="))
```

This will encode.

```
[System.Convert]::ToBase64String([System.Text.Encoding]::UTF8.GetBytes("SecretMessage"))
```

Windows certutil.exe is simpler if you don't need a script.

```
PS D:\HolidayHack2018\Lessons> certutil -decode .\attachment.b64.txt attachment.pdf
Input Length = 133876
Output Length = 97831
CertUtil: -decode command completed successfully.
PS D:\HolidayHack2018\Lessons>
```

In either case, the end of the PDF file we extract has this.

And take everything down one half step for A:

C# B A B C# C# C# B B B C# E E C# B A B C# C# C# C# B B C# B A

We've just taken Mary Had a Little Lamb from Bb to A!

That's a lot of work to find "Mary Had a Little Lamb"

## Up Next

We will need hints from Shiny Upatree and his Sleigh bell lottery terminal before we tackle the last objective. You can find him on the right side of the second floor, near the stairs.