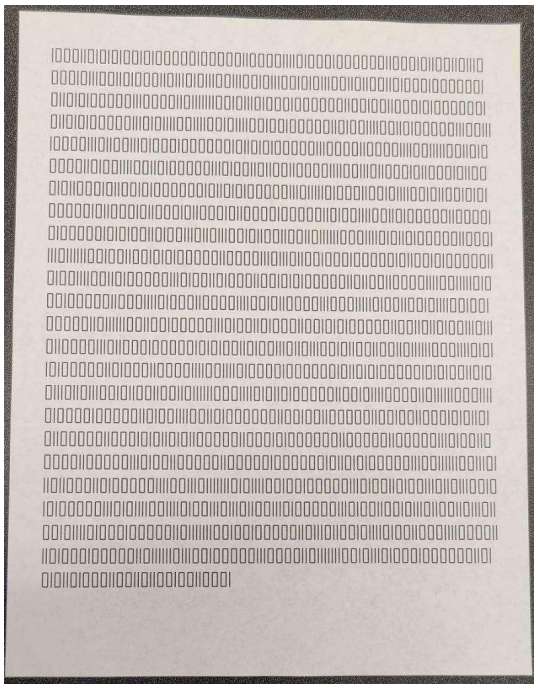
Thoth Challenge 6

Who invented the computer? I must know! Please tell me!
Charles Babbage

Decoded and answered at 12:15 pm

Steps

1. Our group started with the following sheet of paper with binary text at about 11:05 am. (high res)



At first, we tried to scan the paper with our phones and use online OCR services to get computer text, but every OCR attempt would fail us with bad data. Christian and Cody began to type the data line by line and thanks to their hard work, we were able to decode the following text using our first program at 11:53 am:

```
FTP at 138.47.99.64 - port 21 - user is salt - pass is tlasXXXXY - where XXXX is a
TimeLock code and Y is the last character of the final TimeLock hash - TimeLock epoch
is 2021-01-01 00:00:00 - sync your time using telnet or netcat on port 54321
```

2. With the instructions from the paper, we modified our TimeLock code to work with the new server and password format. Like the past challenges, we used gftp to access the FTP server to retrieve the files. However, this time we were unable to download the contents of the FILES directory. At 12:04 pm, Dr. Timofeyev suggested that we use the command line FTP client (lftp) to access the server. This worked and we were able to retrieve these files from the server.

3. After examining the pictures, we noticed that the last picture looked a little off. We applied our pre-programmed brute-force steganography program and guessed that data was hidden with an offset of 1024 bytes with byte mode. As it turns out, we guessed right and the program returned this file when it tried an interval of 32 (note: the .txt was added after the challenge ended).

4. With a simple vim substitution command
   `%s/Ignore everything that is not "binary."//g`
   we found this binary text hidden within the file. By using our binary to ascii program again, we found the following text:

   ```
   A cipher that starts with a V. Use it as a key to help you!
   Bw hepo ks opk frkzriqtk bj klda ilnpciiok avxy y:kmvtrv
   g:vzxvic. Xyii okx glv hzuurf slx.
   ```

5. We tried to use our vigenere program to decode the text according to the instructions. First, we tried a key of "A cipher that starts with a V." Then, we tried "it" followed by "viginere". Finally, we determined that we had misspelled the name of the famous "French diplomat, cryptographer, translator and alchemist" (wikipedia.org) Vigenère. By spelling the gentleman's name right, we were able to decode the following text:

   ```
   Go back to the beginning of this challenge with u:pepper
   p:reppep. Then get the demons out.
   ```

6. We followed those instructions using lftp from the start this time. We were able to find these files in the FILES folder. Since the two files were the same size, we used our xor program and got this image (again, extension added after the fact).

7. Following the instructions of the image and using the username `garlicpowder` and the password `redwopcilrag`, we got our third FILES FTP folder. It had only one text file which contained the final question of the challenge. We googled "who invented the computer" to arrive at our final answer: Charles Babbage.

Contributions

Brendan Guillory
Tried to scan the initial binary sheet but failed. Connected to the FTP servers to download files.

Cameron Robertson
Attempted to convert the binary sheet with no luck. Once the binary was typed up and we got the message I tried using the timelock code to get to the next step. Looked through the pictures we received and noticed the one that was different and one my group used the steg program to get the next files. Lastly i use the vigenere program to decode the messages we received.

Christian Evans
Originally tried scanning initial binary sheet into Notes app and a downloaded app, neither worked. Typed in Word the first 16 lines of binary. Helped Brendan with following steps after he deciphered mine and Cody's binary.

Cody Woessner
Worked on transcribing the binary from the handout to a digital format by hand because we couldn't get any apps to work correctly then worked on finding the error in our transcription.

Drew Young
I was sick and was not able to make it to the final challenge. I emailed Dr. Timofeyev beforehand to let him know and communicated with my team so they knew that I would not be there as well.

Frankie Lavall
Tried many ways on converting the binary document to get the hidden message and it took us forever to get that decoded.

Tristen Barton
I tried using my phone to copy the binary from the piece of paper, but it didn't work so I tried using different websites on it. None of the websites worked so my teammates typed it out by hand. After they typed it out, I used the binary decoder to get the ip, username, epoch time, and part of the password. I then helped decipher the image that was on the FTP server.