Tudorache Alexandru-Theodor

Grupa 342

Laborator 3

Securitatea Sistemelor Informatice

1.

1.

Mesajul

o9/khC3Pf3/9CyNCbdzHPy5oorccEawZSFt3mgCicRnihDSM8Obhlp3vviAVuBbiOtCSz6husBWqhfF0Q/8EZ+6iI9KygD3hAfFgnzyv9w==

transformat in format hex este:

a3dfe4842dcf7f7ffd0b23426ddcc73f2e68a2b71c11ac19485b779a00a27119e284348cf0e6e1969defbe2015b816e23ad092cfa86eb015aa85f17443ff0467eea223d2b2803de101f1609f3caff7

Pentru a transforma am folosit https://base64.guru/converter/decode/hex.

Mesajului obtinut

a3dfe4842dcf7f7ffd0b23426ddcc73f2e68a2b71c11ac19485b779a00a27119e284348cf0e6e1969defbe2015b816e23ad092cfa86eb015aa85f17443ff0467eea223d2b2803de101f1609f3caff7

ii este aplicata operatia de XOR cu cheia

ecb181a479a6121add5b42264db9b44b4b48d7d93c62c56a3c3e1aba64c7517a90ed44f8919484b6ed8acc4670db62c249b9f5bada4ed474c9e4d111308b614788cd4fbdc1e949c1629e12fa5fdbd9

si se obtine

4f6e652054696d652050616420657374652075e2073697374656d20646520637269707461726520706572666563742073696775722064616361206573746520666f6c6f73697420636f726563742e

Pentru a transforma am folosit http://xor.pw.

Mesajul obtinut

4f6e652054696d652050616420657374652075e2073697374656d20646520637269707461726520706572666563742073696775722064616361206573746520666f6c6f73697420636f726563742e este transformat din format hex in string:

One Time Pad este un sistem de criptare perfect sigur daca este folosit corect.

Acesta este mesajul clar primit.

Pentru a transforma am folosit https://string-functions.com/hex-string.aspx.

2.

Da, exista o astfel de cheie.

Pentru a o gasi trebuie parcursi urmatorii pasi:

Transformam mesajul clar in format hex.

Orice text clar poate obtinut dintr-un text criptat cu OTP dar cu o alta cheie.

in format hex este:

4f726963652074657874206361722070617465206f6274696e75742064696e74722d756e20746578742063726970746174206375204f54502064617220637520f20616c746120636865696520

Pentru a transforma am folosit https://string-functions.com/string-hex.aspx.

Mesajului obtinut

4f726963652074657874206361722070617465206f6274696e75742064696e74722d756e20746578742063726970746174206375204f54502064617220637520f20616c74612063686569652e

ii este aplicata operatia de XOR cu mesajul initial in format hex

a3dfe4842dcf7f7ffd0b23426ddcc73f2e68a2b71c11ac19485b779a00a27119e284348cf0e6e1969defbe2015b816e23ad092cfa86eb015aa85f17443ff0467eea223d2b2803de101f1609f3caff7

si se obtine:

ecad8de748ef0b1a857f032101bdb51f5e07c3c37931c37b3c3219ef748215708cf046a18588c1e2f897ca0076ca7f924eb1e6efcb1b905afed5d110228d24049b824cf2d3ec4980219208fa55cad9

Aceasta este cheia ceruta.

Pentru a transforma am folosit http://xor.pw

3.

Daca este refolosita aceeasi cheie, integritatea acesteia scade, intrucat sansele atacatorului de a o ghici cresc.

2.

1. Cifrul lui Cezar

Pentru criptare am ales mesajul:

> *Laborator trei SSI*

Folosind Cifrul lui Cezar cu o shiftare de 6 litere, se obtine:

> *Rghuxgzux zxko YYO*

Pentru decriptare am ales mesajul:

> *Denybkmro Droynyb*

Folosind Cifrul lui Cezar cu o shiftare de 10 litere, se obtine:

> *Tudorache Theodor*

Pentru transformari am folosit https://cryptii.com/pipes/caesar-cipher.

2. Rail Fence Cipher

Pentru criptare am ales mesajul:

> *my cup of tea*

Folosind Rail Fence Cipher, se obtine:

> *MUFAYCPO E T*

Pentru decriptare am ales mesajul:

> *QITULT IEAYM*

Folosind Rail Fence Cipher, se obtine:

> *quality time*

Pentru transformari am folosit https://crypto.interactive-maths.com/rail-fence-cipher.html.

3.

ALICE AND BOB ARE THE WORLDS MOST FAMOUS CRYPTOGRAPHIC COUPLE. SINCE THEIR INVENTION IN 1978, THEY HAVE AT ONCE BEEN CALLED INSEPARABLE, AND HAVE BEEN THE SUBJECT OF NUMEROUS DIVORCES, TRAVELS, AND TORMENTS. IN THE ENSUING YEARS, OTHER CHARACTERS HAVE JOINED THEIR CRYPTOGRAPHIC FAMILY. THERES EVE, THE PASSIVE AND SUBMISSIVE EAVESDROPPER, MALLORY THE MALICIOUS ATTACKER, AND TRENT, TRUSTED BY ALL, JUST TO NAME A FEW. WHILE ALICE, BOB, AND THEIR EXTENDED FAMILY WERE ORIGINALLY USED TO EXPLAIN HOW PUBLIC KEY CRYPTOGRAPHY WORKS, THEY HAVE SINCE BECOME WIDELY USED ACROSS OTHER SCIENCE AND ENGINEERING DOMAINS. THEIR INFLUENCE CONTINUES TO GROW OUTSIDE OF ACADEMIA AS WELL: ALICE AND BOB ARE NOW A PART OF GEEK LORE, AND SUBJECT TO NARRATIVES AND VISUAL DEPICTIONS THAT COMBINE PEDAGOGY WITH IN-JOKES, OFTEN REFLECTING OF THE SEXIST AND HETERONORMATIVE ENVIRONMENTS IN WHICH THEY WERE BORN AND CONTINUE TO BE USED. MORE THAN JUST THE WORLDS MOST FAMOUS CRYPTOGRAPHIC COUPLE, ALICE AND BOB HAVE BECOME AN ARCHETYPE OF DIGITAL EXCHANGE, AND A LENS THROUGH WHICH TO VIEW BROADER DIGITAL CULTURE. Q.DUPONT AND A.CATTAPAN CRYPTOCOUPLE

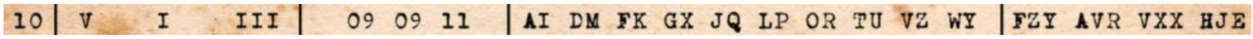
Pentru transformare am folosit:

http://scottbryce.com/cryptograms/ si https://www.dcode.fr/monoalphabetic-substitution.

4.

1.

Am ales ziua 10 din https://operationturing.tumblr.com/image/143702293214:

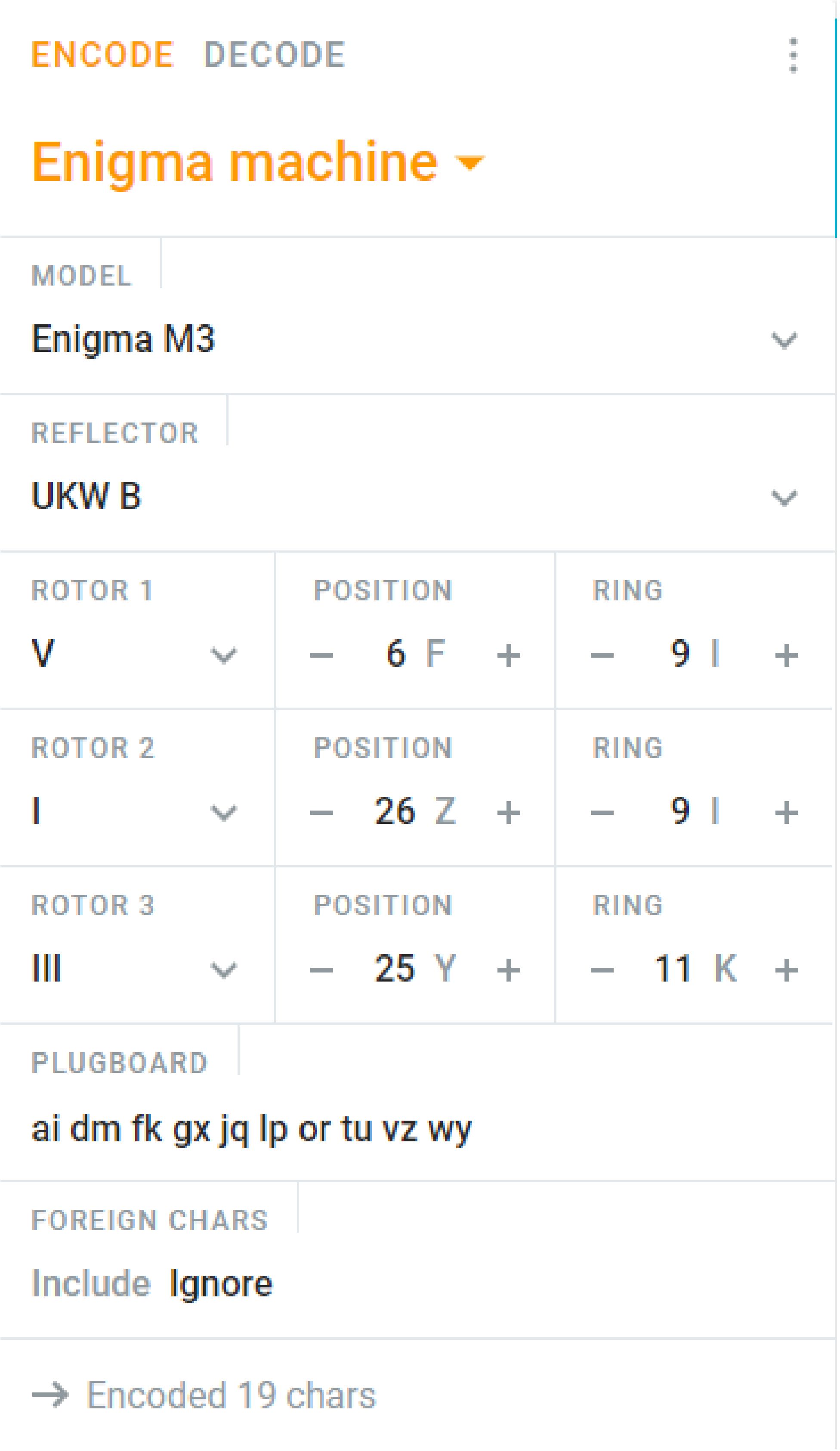


10	V I III	09 09 11	AI DM FK GX JQ LP OR TU VZ WY	FZY AVR VXX HJE

2.

Am folosit simulatorul https://cryptii.com/pipes/enigma-machine.

Am facut setarile aferente zilei (cu pozitia initiala a rotoareler FZY):



Enigma machine

MODEL
Enigma M3

REFLECTOR
UKW B

ROTOR 1	POSITION	RING
V	− 6 F +	− 9 I +

ROTOR 2	POSITION	RING
I	− 26 Z +	− 9 I +

ROTOR 3	POSITION	RING
III	− 25 Y +	− 11 K +

PLUGBOARD
ai dm fk gx jq lp or tu vz wy

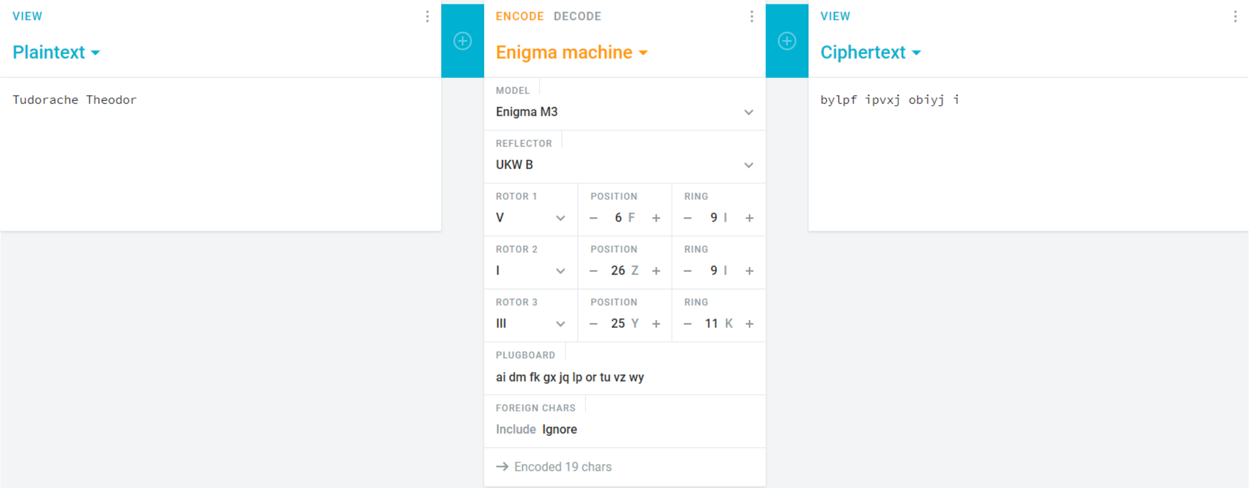
FOREIGN CHARS
Include [✓ Ignore]

→ Encoded 19 chars

3.

Rezultatul obtinut:

bylpf ipvxj obiyj i



Tudorache Theodor

MODEL
Enigma M3

REFLECTOR
UKW B

ROTOR 1	POSITION	RING
V	6 F	9 I

ROTOR 2	POSITION	RING
I	26 Z	9 I

ROTOR 3	POSITION	RING
III	25 Y	11 K

PLUGBOARD
ai dm fk gx jq lp or tu vz wy

FOREIGN CHARS
Include Ignore

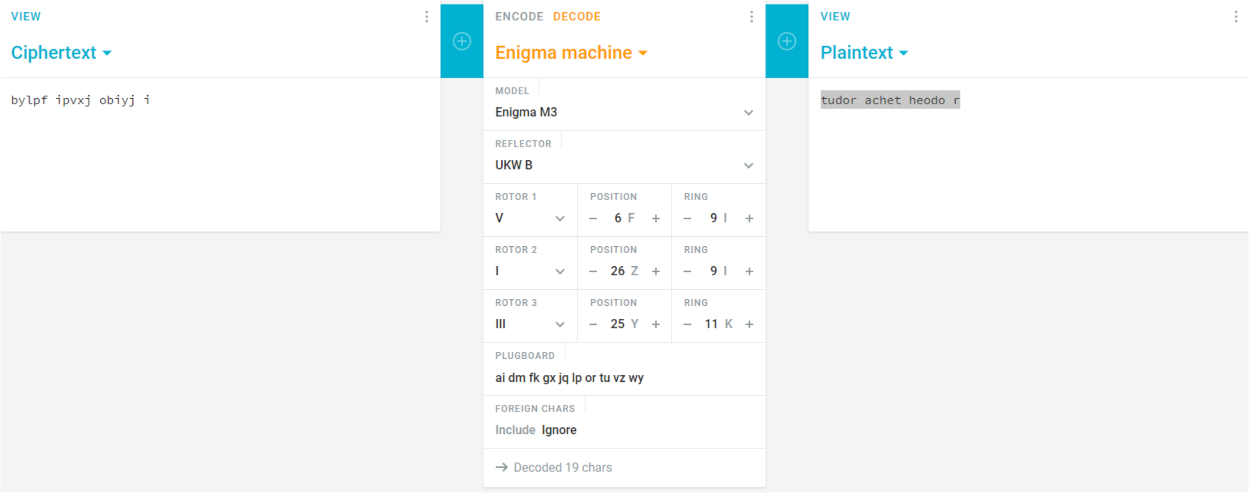
→ Encoded 19 chars

bylpf ipvxj obiyj i

4.

Rezultatul obtinut:

tudor achet heodo r



bylpf ipvxj obiyj i

MODEL
Enigma M3

REFLECTOR
UKW B

ROTOR 1	POSITION	RING
V	6 F	9 I

ROTOR 2	POSITION	RING
I	26 Z	9 I

ROTOR 3	POSITION	RING
III	25 Y	11 K

PLUGBOARD
ai dm fk gx jq lp or tu vz wy

FOREIGN CHARS
Include Ignore

→ Decoded 19 chars

tudor achet heodo r

5.

Exemplu de text criptat care nu ar putea fi criptatea numelui:

tomod iphej aoedk l

Literele subliniate sunt aceleasi cu cele din nume, ceea ce este imposibil, intrucat Enigma Machine nu cripteaza niciodata o litera in ea insasi.