NIST College Banepa
Department of BScCSIT
5th Semester

Cyrptography

Tutorial 2

1. Given the plaintext "LOST IN PARADISE", computer the ciphertext for
    a. The ceaser cipher with key = 5
    b. The Railfence cipher with rails = 4

2. Encrypt the message "NANI" using the Hill cipher with the key $\begin{bmatrix} 4 & 5 \\ 6 & 9 \end{bmatrix}$. Show your calculation and the result.

3. Encrypt the message "MEET ME TONIGHT" using the Hill cipher with the key $\begin{bmatrix} 9 & 4 \\ 5 & 7 \end{bmatrix}$. Show your calculation and the result.

4. Construct a playfair matrix with the key *EXAMPLE*. Using this matrix encrypt the message "Hide the Gold".

5. Using this playfair matrix

J/K	C	D	E	F
U	N	P	Q	S
Z	V	W	X	Y
R	A	L	G	O
B	I	T	H	M

    Encrypt the message "I only regret that I have but one life to give for my country"

6. Encrypt the message "computing for human life" to playfair cipher using key *BSCCSIT*.

7. Use the Playfair cipher to encipher the message "The key is hidden under the door pad". The secret key can be made by filling the first and part of the second row with the word "*GUIDANCE*" and filling the rest of the matrix with the rest of the alphabet.

8. Encrypt the message "the house is being sold tonight" using one of the following ciphers. Ignore the space between words. Decrypt the message to get the plaintext:
    a. Vigenere cipher with key: "*dollars*"
    b. Autokey cipher with key = 7.

9. Use the Vigenere cipher with keyword "*HEALTH*" to encipher the message "Life is full of surprises".

10. Calculate the determinant mod 26 of

    i. $\begin{pmatrix} 23 & 5 \\ 13 & 7 \end{pmatrix}$

    ii. $\begin{pmatrix} 21 & 13 & 25 \\ 5 & 7 & 18 \\ 3 & 14 & 12 \end{pmatrix}$

11. Determine the inverse mod 26 of

    i. $\begin{pmatrix} 2 & 3 \\ 1 & 22 \end{pmatrix}$

    ii. $\begin{pmatrix} 6 & 24 & 1 \\ 13 & 16 & 10 \\ 20 & 17 & 15 \end{pmatrix}$

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