Lab-06



AIM: - Write a mogrum to implement
Hill cipher too 2x2, and gx3
mutrics.

source code: -

melude of functions. h"

define ments vectors valvors m+>>

And robushes

Int domod 26 (int num)

while (num < 26)

num+=26',

seturn num 4.26;

meetrix get Cofactor (matrix mut) inte, int 9)

int i=0, j=0, n= meet.sizel); mutn'al cofactor Mat (n-1, wester (m+) (n-1);

tor(int col =0; colx n; +tcol)
it (row)= P 44 al=q)

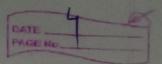
3 i++

return cotactor tacet; int determinant (meetrice meet, int size) int n= met. 5720); d=0; it (size = =1) return melt [0][0]; int sign=1; meetrix coffeltor Meet (n, veltor 2 mt) on); for(col=0; col(size; ++col) cotcutor Mat 2 getCofultor (mut, 0, col); U+= sign# melt[0][col] * determinant (ascellarment) sign = -1 x sign;

return domod 20 (d);

```
mut vise advoint matrix (mentix ment)
     int no mut strell;
     it(n==1)
        mut CoJCoJ = 1;
        return meit;
     int signali
    tor(in+ 1=0; i(n; ++i)
        torcint 1=0; 1(n; ++1)
           estactor meet = get cotaltor (meet i vi).
           sign = (i+v') -/. 2 == 0 ? 1: +;
           advomatment [] I [] = sign A
                           Jetrmmumt (
                           Coscutor met n-1);
          adjoint mut(v)[i] = do mod 26
                         (colion+mut(s)(i)
             Leaf Michiga
```

return advoint met;



mutrix find Inverse Meetrix (meetrix meet) int n= meet size() inverse Det = meetiplicative Inverse (seterminent (mut, on), 26). advoint trut = advoint Mutisel meet); forc m+ i=0; i<n; ++i). muerse met [j][j] = domod28(adjoint meet[][v] * muerseDet)); return inverseDet; mutrix generate key Matrix (mt size) metrix Keytactrixi; it (srze==2) meetrise key { 7, 113, {8, 11}}; Key Mutrix 2 Key;

else it (size = = 3) mutrice Key 2 3745, 113, 54, 18, 13, (3118/133) Keymutine = key; else (512e = = 4) mutrix key { 2 9,7,11,13}, 24,7,5,63, 2,21,14,93 {3,23,21,8}}; Keytautix 2 key; return key mutil

void Print Matrix (meetrise meet) torcint 1=0; it must stre; ++i) forcint (=0; 5< ment co], spec(); +45) cout << meet [[] [] << 11 11.

conficond!;

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mutisc generate Plain Text Matrix (String Plain Text, int column).

int row = ceil (plaintent.length()*1.0/

it (trow & column) > PlainTest length(s)

1ht dift = rowx column - PlainText. length ()

while (fitt--)
plaintout-+= 121;

torcint i=0; i (row; ++i)

torcint i=0; i (row; ++i)

plainText meet rioc(i)[i]

= int (PlainText [column * i+i]-'a'

Character Plaint Tout Martine:

return PainTent Matrix.

real Man Se (OS D + M) Se

1111 Harry 25 14,02

il brosstu

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mutrix encryption (mutrix key, meetrix plaintent meetrix)

int row = PlainTest Matrix. STREET, column = PlainTest Matrix [0]. STREET;

mutrix of ther Text mutrix;

torcint i=0; i<row; ++i)

torcint i=0; i< column; ++i)

torcintk=0; k<column; ++k)

temp + = plainText metrie (j][j]

* Koef[j][j] #20

clehertentmutrix(i)[i]= temp 1.28. temp 20;

return cipherTest Mutix,

string convert To Test (mutrix ment)

string tout = "";

for (int i=0; i < meet, size(); ++i)

tor (int v=0; v < meet [o]. size(); +tv)

tent += meet [i][i] + al;

return tenti

String deeryption (meetrix ciphor, mutrix, koy) intersement = tindenverse recetaix (kary for (int (IO; ix row; ++i) tor(m 1 = 0; 1 < n; ++5) for (MA K =0, ken; ++ k) tempt= ciphorTestmutrix[i][k] Xt Muer Ford Meet [K][j] decry Plas truty ([] [] = to mot (temp); temp201 cout << " Decompted mathon, in"; print meetrix (decrypted Matrix); return convertToTeset (Jeogeted Mutrix); int main() string plantent, danyted Test; int stre! coutec' Enter plantent ""

em>> plainText; couter" Finter size of the key marrise;"; can 77 size; it (size >4 11 size())?

contect size is not verlid"; enition; Key Mutrise = generate kontract size); Pt Mutrix > Senercite Pantext Matrix plaintout sizer. contec' key raktix: "n'j print Metrix (key mutno). cout << " Placin Test mutrix: " 2(end); print Mutrix (Paintery Meetrix); cipherText Matrix - encryption (Keymatrix PlainText Mutix), contect Encryption mutrix: in Pront (iPhertext muthix."). contex! Encrypted Tent: "Le contento Tent cipherText matrix) < (end) dempted Test = demption (citherTest mater, Key mution); courted" Decrypted Text: "< decrypted Text completed Text 2000); return o;

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	Imput
	Enter PlainTest: munet tran
	Enter size of the key meeting:3
013	key meeting. Plain Tent Matrix.
	7 25 11 12 20 13
	4 18 0 5 3
	3 18 1 8 21 0
	13 25 25
	Encryption matrix:
Kenstry	21 10 9
+ (3 14 & Gnerypted Tent: VKJdojkgfgd]
	10 6 5
	6 3 11
	4 pages 1 serault and and state and
	Deny Hed mutrix
	12 20 13
1	0 5 3 pergeted text: munatowanzz.
	8 210
	13 25 25
	The Party of the Aust bold and the Aust