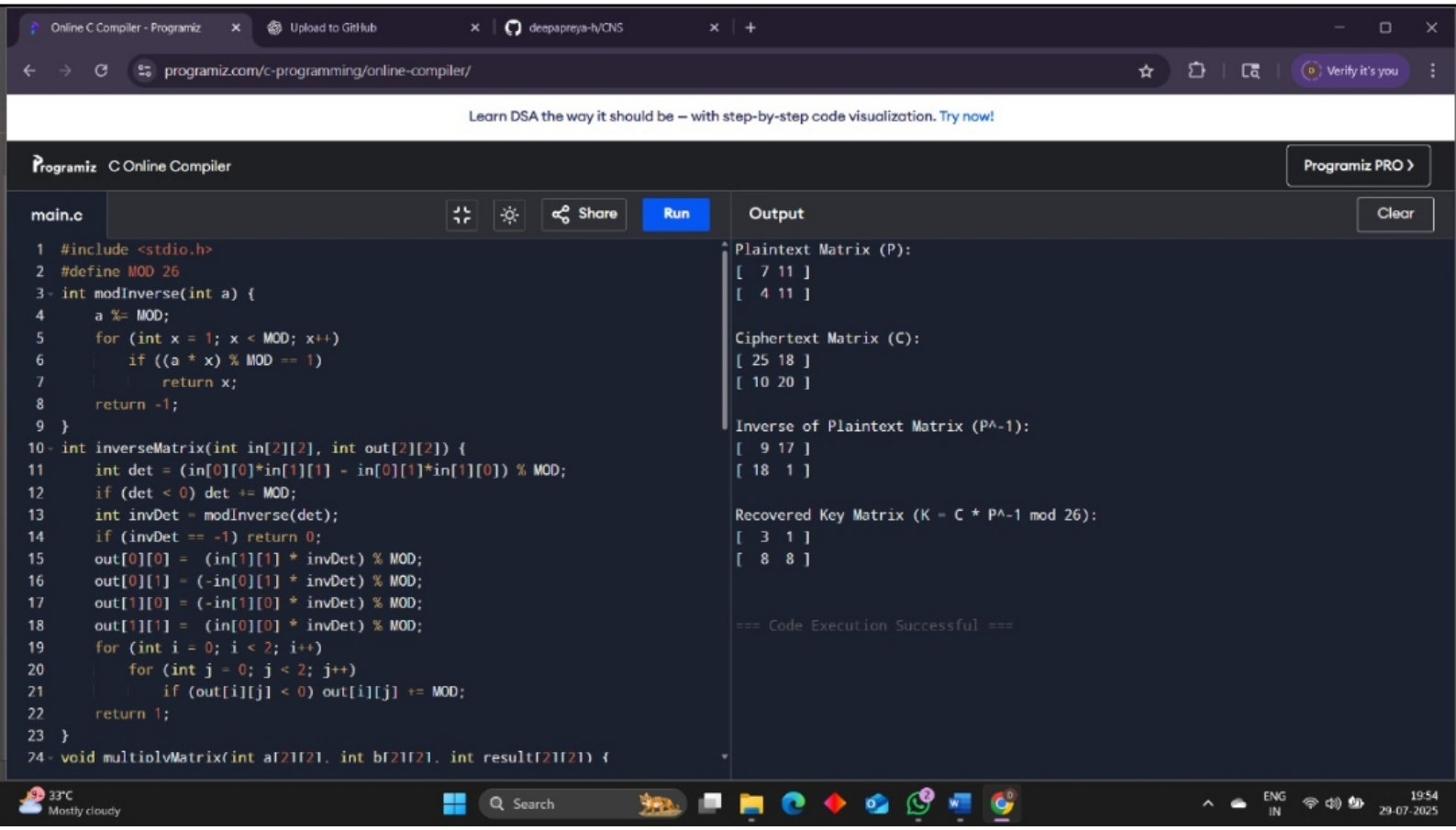
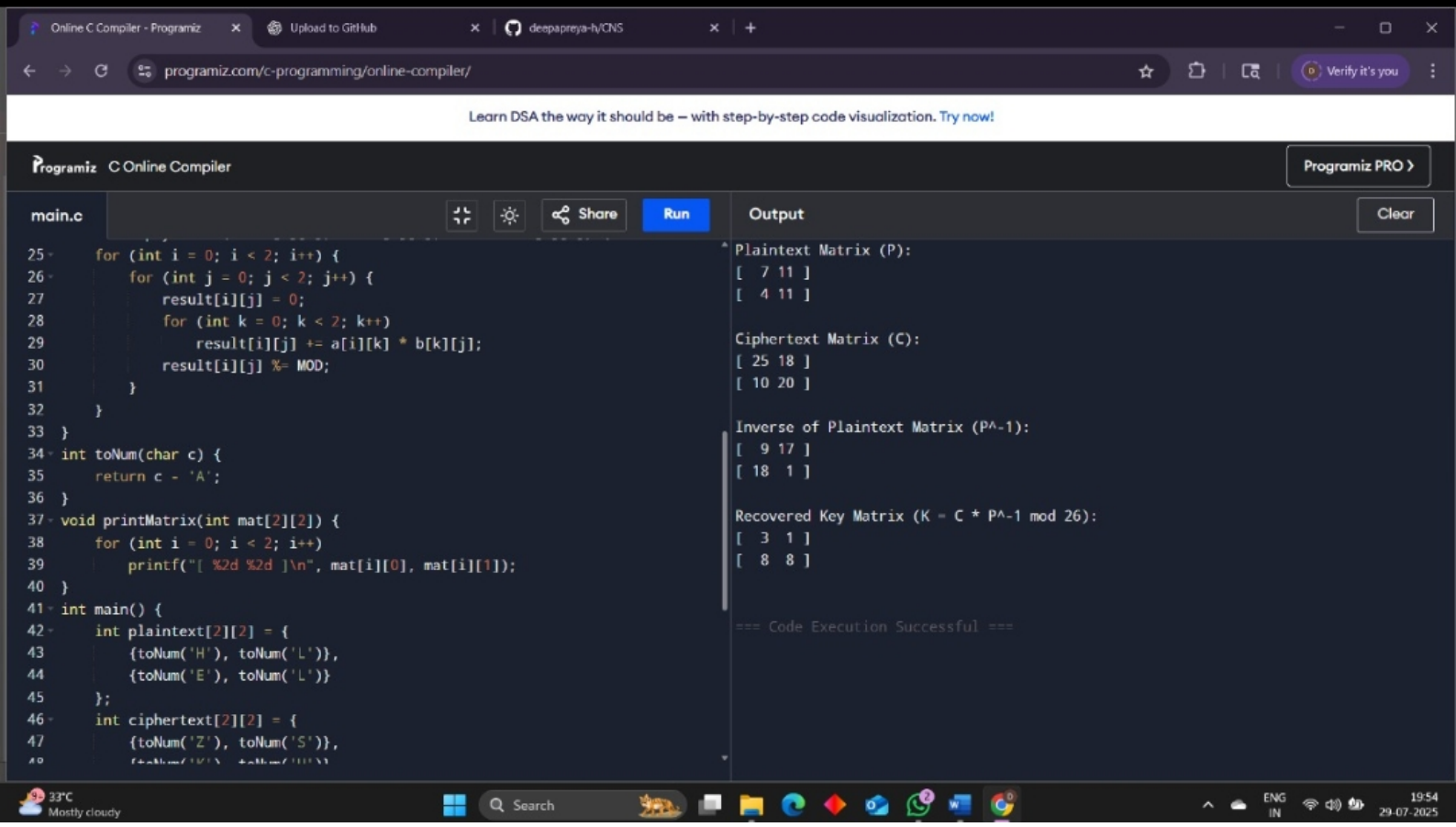
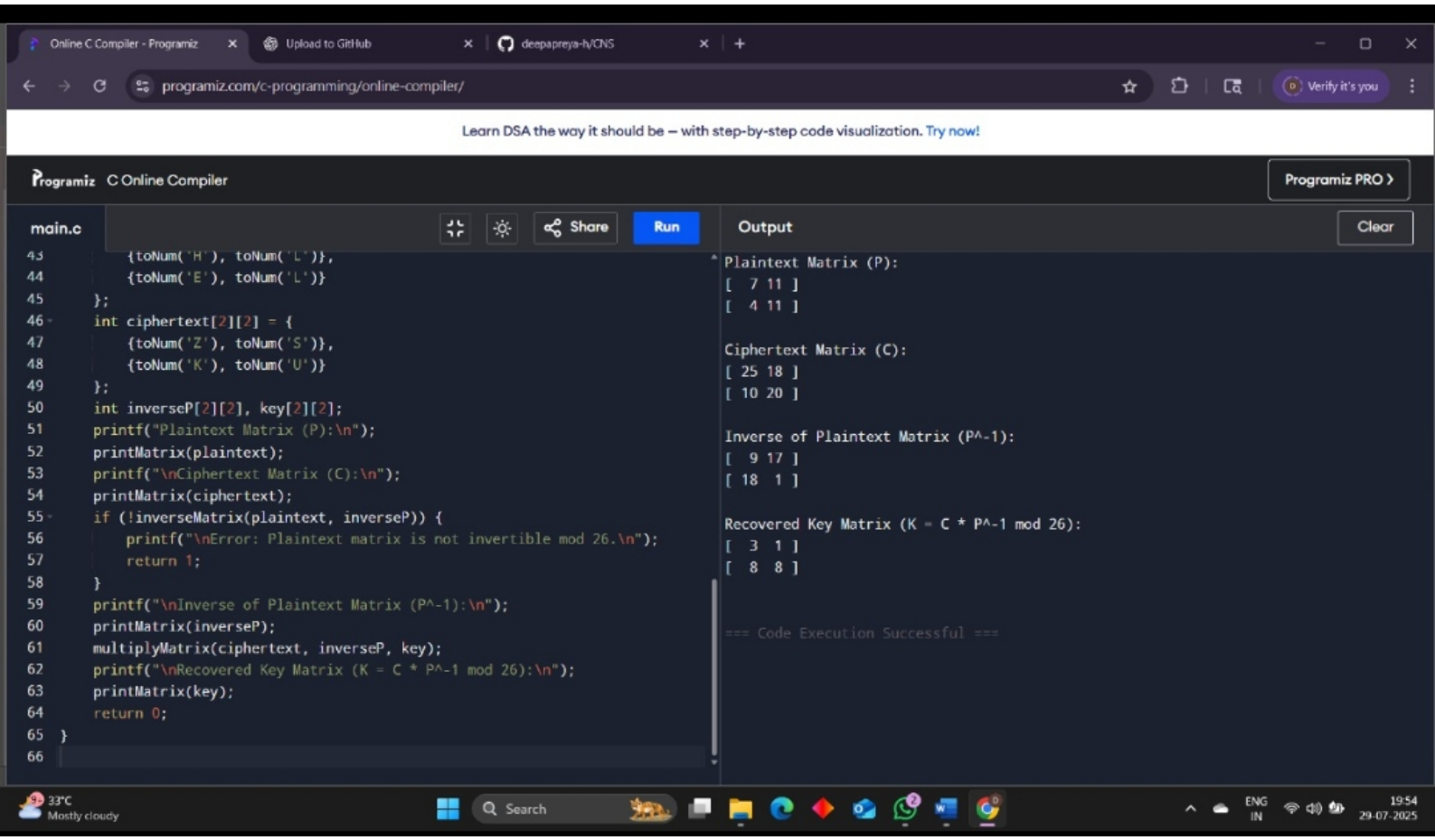

Online C Compiler - Programiz
Upload to GitHub
deepapreya-h/CNS
programiz.com/c-programming/online-compiler/
Verify it's you
Learn DSA the way it should be — with step-by-step code visualization. Try now!
Programiz C Online Compiler
Programiz PRO
main.c
Share
Run
Output
Clear
#include <stdio.h>
#define MOD 26
int modInverse(int a) {
a %= MOD;
for (int x = 1; x < MOD; x++)
if ((a * x) % MOD == 1)
return x;
return -1;
}
int inverseMatrix(int in[2][2], int out[2][2]) {
int det = (in[0][0]*in[1][1] - in[0][1]*in[1][0]) % MOD;
if (det < 0) det += MOD;
int invDet = modInverse(det);
if (invDet == -1) return 0;
out[0][0] = (in[1][1] * invDet) % MOD;
out[0][1] = (-in[0][1] * invDet) % MOD;
out[1][0] = (-in[1][0] * invDet) % MOD;
out[1][1] = (in[0][0] * invDet) % MOD;
for (int i = 0; i < 2; i++)
for (int j = 0; j < 2; j++)
if (out[i][j] < 0) out[i][j] += MOD;
return 1;
}
void multiplyMatrix(int a[2][2], int b[2][2], int result[2][2]) {
Plaintext Matrix (P):
[7 11]
[4 11]
Ciphertext Matrix (C):
[25 18]
[10 20]
Inverse of Plaintext Matrix (P^-1):
[9 17]
[18 1]
Recovered Key Matrix (K = C * P^-1 mod 26):
[3 1]
[8 8]
=== Code Execution Successful ===
33°C
Mostly cloudy
Search
ENG
IN
19:54
29-07-2025


Online C Compiler - Programiz
Upload to GitHub
deepapreya-h/CNS
programiz.com/c-programming/online-compiler/
Verify it's you
Learn DSA the way it should be — with step-by-step code visualization. Try now!
Programiz C Online Compiler
Programiz PRO
main.c
Share
Run
Output
Clear
for (int i = 0; i < 2; i++) {
for (int j = 0; j < 2; j++) {
result[i][j] = 0;
for (int k = 0; k < 2; k++)
result[i][j] += a[i][k] * b[k][j];
result[i][j] %= MOD;
}
}
}
int toNum(char c) {
return c - 'A';
}
void printMatrix(int mat[2][2]) {
for (int i = 0; i < 2; i++)
printf("[%2d %2d]\n", mat[i][0], mat[i][1]);
}
int main() {
int plaintext[2][2] = {
{toNum('H'), toNum('L')},
{toNum('E'), toNum('L')}
};
int ciphertext[2][2] = {
{toNum('Z'), toNum('S')},
Plaintext Matrix (P):
[7 11]
[4 11]
Ciphertext Matrix (C):
[25 18]
[10 20]
Inverse of Plaintext Matrix (P^-1):
[9 17]
[18 1]
Recovered Key Matrix (K = C * P^-1 mod 26):
[3 1]
[8 8]
=== Code Execution Successful ===
33°C
Mostly cloudy
Search
ENG
IN
19:54
29-07-2025


Online C Compiler - Programiz
Upload to GitHub
deepapreya-h/CNS
programiz.com/c-programming/online-compiler/
Verify it's you
Learn DSA the way it should be — with step-by-step code visualization. Try now!
Programiz C Online Compiler
Programiz PRO
main.c
Share
Run
Output
Clear
{toNum('H'), toNum('L')},
{toNum('E'), toNum('L')}
};
int ciphertext[2][2] = {
{toNum('Z'), toNum('S')},
{toNum('K'), toNum('U')}
};
int inverseP[2][2], key[2][2];
printf("Plaintext Matrix (P):\n");
printMatrix(plaintext);
printf("\nCiphertext Matrix (C):\n");
printMatrix(ciphertext);
if (!inverseMatrix(plaintext, inverseP)) {
printf("\nError: Plaintext matrix is not invertible mod 26.\n");
return 1;
}
printf("\nInverse of Plaintext Matrix (P^-1):\n");
printMatrix(inverseP);
multiplyMatrix(ciphertext, inverseP, key);
printf("\nRecovered Key Matrix (K = C * P^-1 mod 26):\n");
printMatrix(key);
return 0;
}
Plaintext Matrix (P):
[7 11]
[4 11]
Ciphertext Matrix (C):
[25 18]
[10 20]
Inverse of Plaintext Matrix (P^-1):
[9 17]
[18 1]
Recovered Key Matrix (K = C * P^-1 mod 26):
[3 1]
[8 8]
=== Code Execution Successful ===
33°C
Mostly cloudy
Search
ENG
IN
19:54
29-07-2025