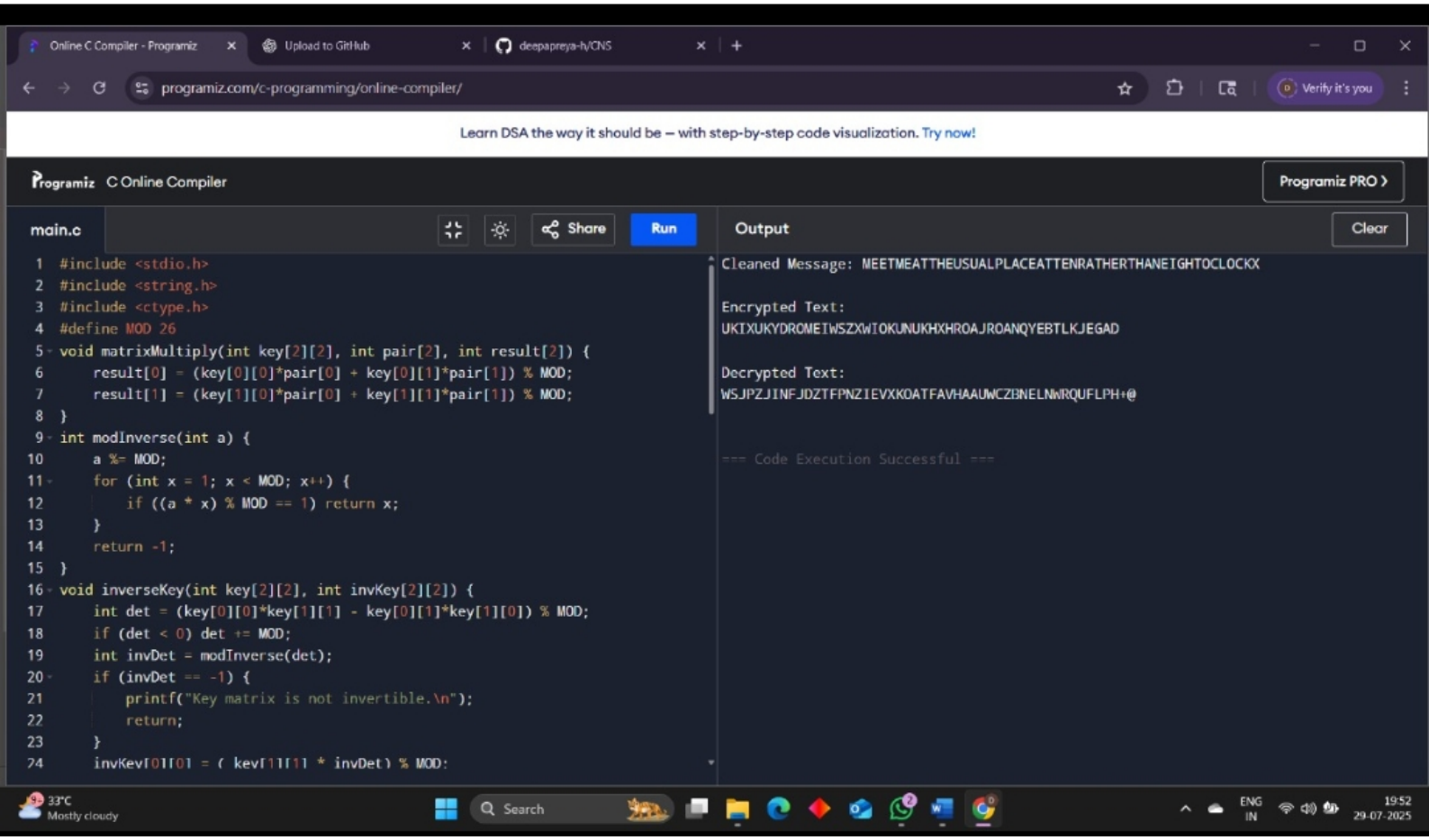
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main.c
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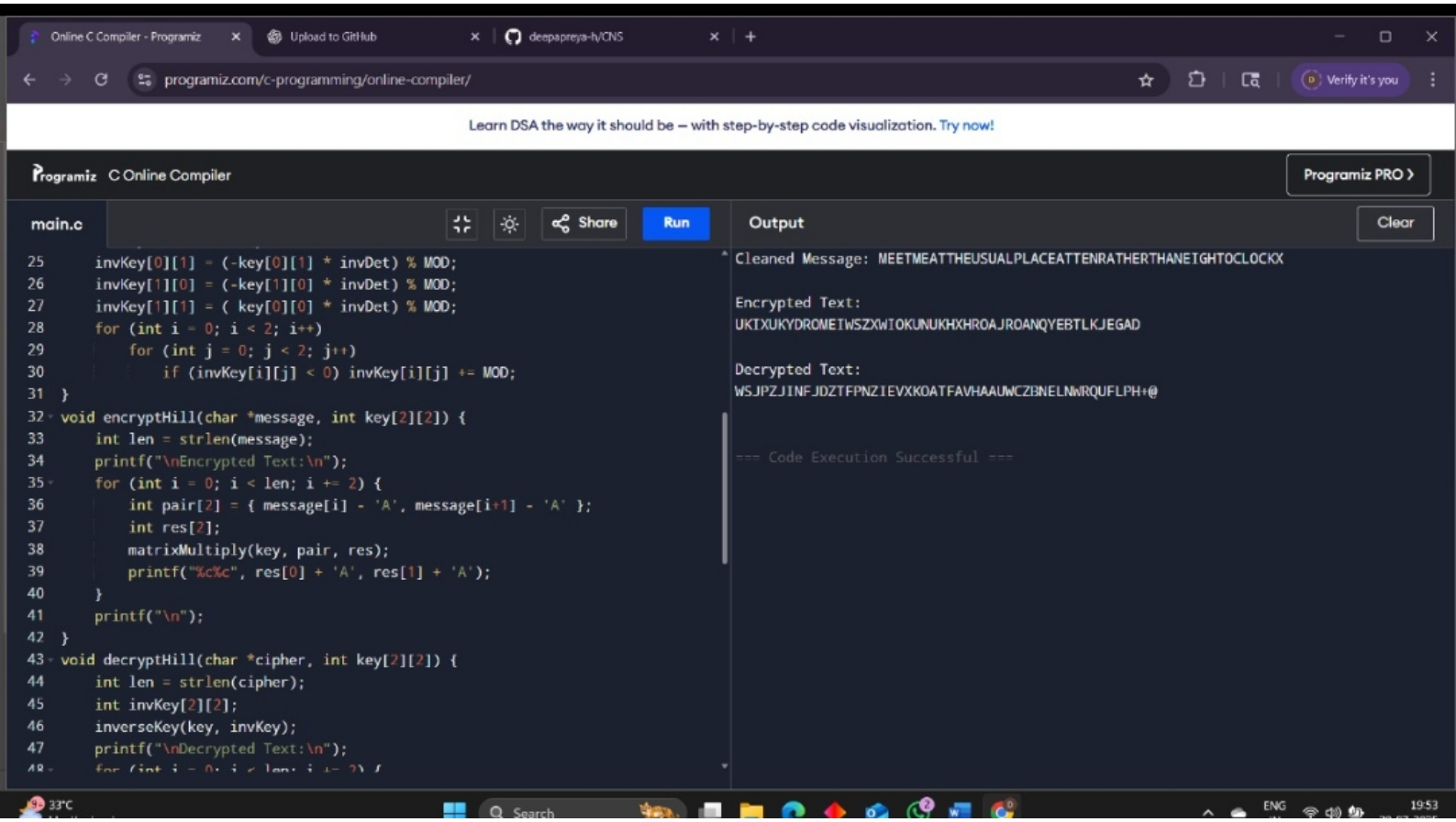
Clear
#include <stdio.h>
#include <string.h>
#include <ctype.h>
#define MOD 26
void matrixMultiply(int key[2][2], int pair[2], int result[2]) {
result[0] = (key[0][0]*pair[0] + key[0][1]*pair[1]) % MOD;
result[1] = (key[1][0]*pair[0] + key[1][1]*pair[1]) % MOD;
}
int modInverse(int a) {
a %= MOD;
for (int x = 1; x < MOD; x++) {
if ((a * x) % MOD == 1) return x;
}
return -1;
}
void inverseKey(int key[2][2], int invKey[2][2]) {
int det = (key[0][0]*key[1][1] - key[0][1]*key[1][0]) % MOD;
if (det < 0) det += MOD;
int invDet = modInverse(det);
if (invDet == -1) {
printf("Key matrix is not invertible.\n");
return;
}
Cleaned Message: MEETMEATTHEUSUALPLACEATTENRATHERTHANEIGHTOCLOCKX
Encrypted Text:
UKIXUKYDROMEIWSZXWIOKUNUKHXHROAJROANQYEBTLKJEGAD
Decrypted Text:
WSJPZJINFJDZTFPNZIEVXKOATFAVHAAUWCZBNELNWRQUFLPH+@
=== Code Execution Successful ===
33°C
Mostly cloudy
Search
ENG
IN
19:52
29-07-2025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invKey[0][1] = (-key[0][1] * invDet) % MOD;
invKey[1][0] = (-key[1][0] * invDet) % MOD;
invKey[1][1] = (key[0][0] * invDet) % MOD;
for (int i = 0; i < 2; i++)
for (int j = 0; j < 2; j++)
if (invKey[i][j] < 0) invKey[i][j] += MOD;
}
void encryptHill(char *message, int key[2][2]) {
int len = strlen(message);
printf("\nEncrypted Text:\n");
for (int i = 0; i < len; i += 2) {
int pair[2] = { message[i] - 'A', message[i+1] - 'A' };
int res[2];
matrixMultiply(key, pair, res);
printf("%c%c", res[0] + 'A', res[1] + 'A');
}
printf("\n");
}
void decryptHill(char *cipher, int key[2][2]) {
int len = strlen(cipher);
int invKey[2][2];
inverseKey(key, invKey);
printf("\nDecrypted Text:\n");
Cleaned Message: MEETMEATTHEUSUALPLACEATTENRATHERTHANEIGHTOCLOCKX
Encrypted Text:
UKIXUKYDROMEIWSZXWIOKUNUKHXHROAJROANQYEBTLKJEGAD
Decrypted Text:
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Search
ENG
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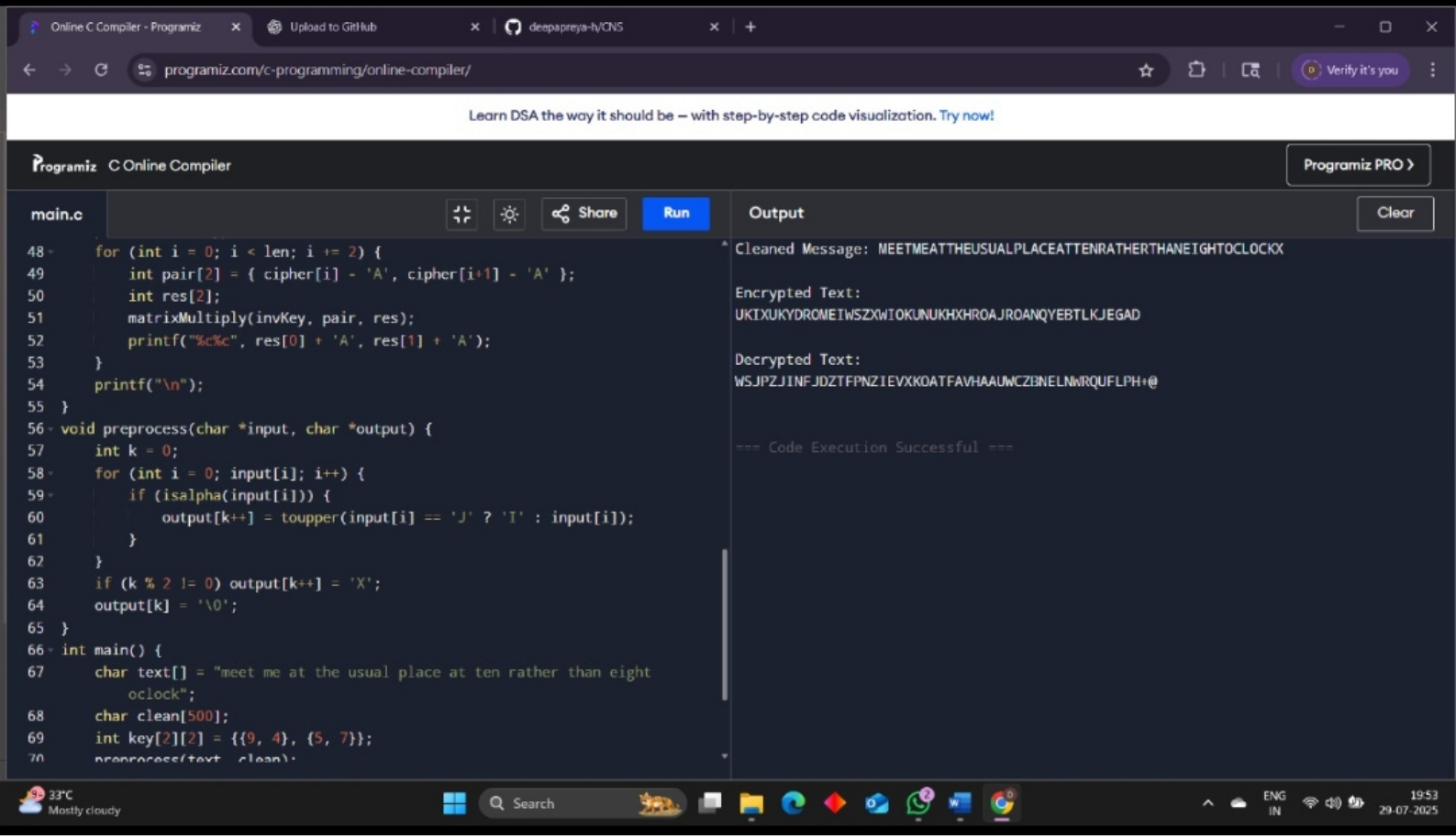
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for (int i = 0; i < len; i += 2) {
int pair[2] = { cipher[i] - 'A', cipher[i+1] - 'A' };
int res[2];
matrixMultiply(invKey, pair, res);
printf("%c%c", res[0] + 'A', res[1] + 'A');
}
printf("\n");
}
void preprocess(char *input, char *output) {
int k = 0;
for (int i = 0; input[i]; i++) {
if (isalpha(input[i])) {
output[k++] = toupper(input[i] == 'J' ? 'I' : input[i]);
}
}
if (k % 2 != 0) output[k++] = 'X';
output[k] = '\0';
}
int main() {
char text[] = "meet me at the usual place at ten rather than eight
oclock";
char clean[500];
int key[2][2] = {{9, 4}, {5, 7}};
Cleaned Message: MEETMEATTHEUSUALPLACEATTENRATHERTHANEIGHTOCLOCKX
Encrypted Text:
UKIXUKYDROMEIWSZXWIOKUNUKHXHROAJROANQYEBTLKJEGAD
Decrypted Text:
WSJPZJINFJDZTFPNZIEVXKOATFAVHAAUWCZBNELNWRQUFLPH+@
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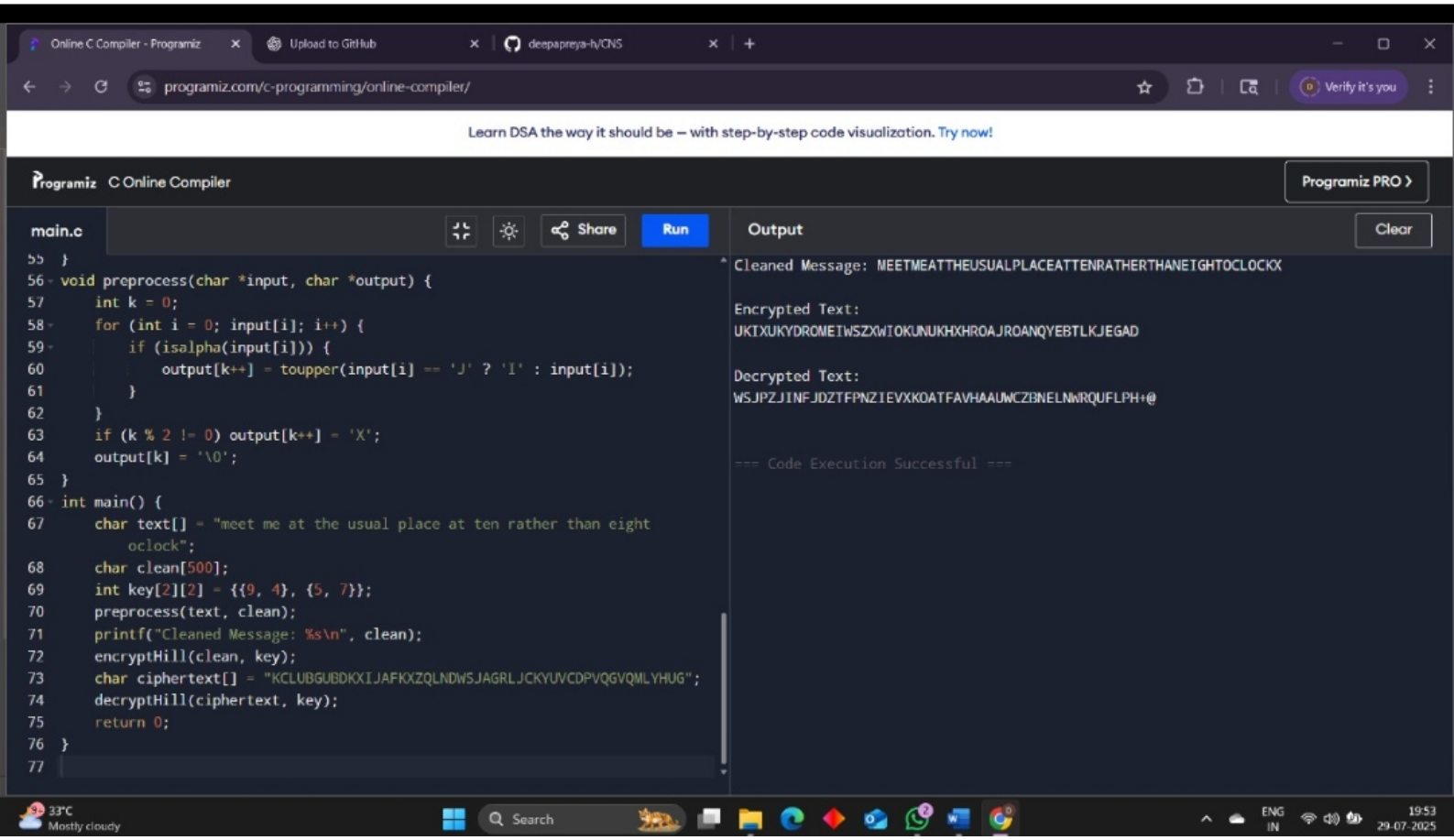
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}
void preprocess(char *input, char *output) {
int k = 0;
for (int i = 0; input[i]; i++) {
if (isalpha(input[i])) {
output[k++] = toupper(input[i] == 'J' ? 'I' : input[i]);
}
}
if (k % 2 != 0) output[k++] = 'X';
output[k] = '\0';
}
int main() {
char text[] = "meet me at the usual place at ten rather than eight
oclock";
char clean[500];
int key[2][2] = {{9, 4}, {5, 7}};
preprocess(text, clean);
printf("Cleaned Message: %s\n", clean);
encryptHill(clean, key);
char ciphertext[] = "KCLUBGUBDKXIJAFKXZQLNDWSJAGRLJCKYUVCDPVQGVQMLYHUG";
decryptHill(ciphertext, key);
return 0;
}
Cleaned Message: MEETMEATTHEUSUALPLACEATTENRATHERTHANEIGHTOCLOCKX
Encrypted Text:
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