**Theory:**

The Vigenère cipher is a plain-text form of encoding that uses alphabetical substitution to encode text. This ancient form of cryptography dates to the 1400s and was documented in the works of famous writers of the era such as Tritheism.

The Vigenère cipher is an algorithm that is used to encrypt and decrypt text. The Vigenère cipher is an algorithm of encrypting an alphabetic text that uses a series of interwoven Caesar ciphers. It is based on a keyword's letters. It is an example of a polyalphabetic substitution cipher. This algorithm is easy to understand and implement. This algorithm was first described in 1553 by Giovan Battista Bellaso. It uses a Vigenère table or Vigenère square for encryption and decryption of the text. The Vigenère table is also called the tabula recta.

Encryption: The first letter of the plaintext is combined with the first letter of the

key.

Cipher Text (Ei) = (Pi + Ki) mod 26

Decryption: Decryption is done by the row of keys in the Vigenère table. First, select the row of the key letter, find the ciphertext letter's position in that row, and then select the column label of the corresponding ciphertext as the plaintext.

Plain Text (Di)= (Ei - Ki) mod 26

**Programming Language: C**

**IDE: DEV C++**

**Code :**

#include <stdio.h>

#include <stdlib.h>

#include <string.h>

#include <ctype.h>

void upper\_case(char \*src) {

while (\*src != '\0') {

if (islower(\*src))

\*src &= ~0x20;

src++;

}

}

char\* encipher(const char \*src, char \*key, int is\_encode) {

int i, klen, slen;

char \*dest;

dest = strdup(src);

upper\_case(dest);

upper\_case(key);

for (i = 0, slen = 0; dest[slen] != '\0'; slen++)

if (isupper(dest[slen]))

dest[i++] = dest[slen];

dest[slen = i] = '\0'; /\* null pad it, make it safe to use \*/

klen = strlen(key);

for (i = 0; i < slen; i++) {

if (!isupper(dest[i]))

continue;

dest[i] = 'A' + (is\_encode ? dest[i] - 'A' + key[i % klen] - 'A'

: dest[i] - key[i % klen] + 26) % 26;

}

return dest;

}

int main() {

const char \*str = "Kathmandu is the populated city";

const char \*cod, \*dec;

char key[] = "VIGENERECIPHER";

printf("Text: %s\n", str);

printf("key: %s\n", key);

cod = encipher(str, key, 1);

printf("Cipher Text: %s\n", cod);

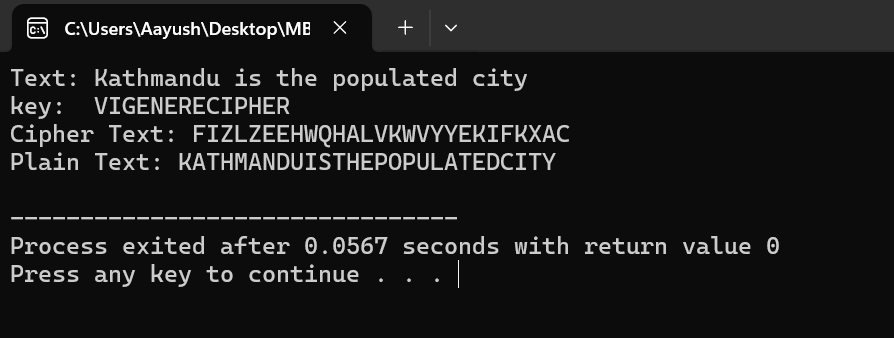
dec = encipher(cod, key, 0);

printf("Plain Text: %s\n", dec);

return 0;

}

**Output**

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