

EX NO:04

DATE:22.02.24

Perform encryption and decryption of a message using Vigenère Cipher substitution technique.

Aim: To write a c program to perform encryption and decryption of a message using Vigenere Cipher substitution technique.

Algorithm:

1. Include necessary header files (<stdio.h> and <string.h>).
2. Declare character arrays for the original message (msg), encryption key (key), new key (newKey), encrypted message (encryptedMsg), and decrypted message (decryptedMsg).
3. Declare integer variables msgLen, keyLen, i, and j for storing lengths and loop indices.
4. Initialize msg and key with the original message and encryption key.
5. Calculate msgLen and keyLen using strlen.
6. Use a loop to generate the new key (newKey) based on the original key (key).
7. Initialize i and j to 0.
8. Use a loop to iterate over each character in the original message (msg).
9. Combine it with the corresponding character from the new key (newKey) using modular arithmetic.
10. Add a null terminator at the end of the decrypted message.

Program:

```
#include <stdio.h>
#include <string.h>
#include <ctype.h>
void vigenere(char *text, char *key, char *result, int encrypt) {
    int text_len = strlen(text);
    int key_len = strlen(key);
    int i;
    for (i = 0; i < text_len; i++) {
        if (!isalpha(text[i])) {
            result[i] = text[i];
            continue;
        }
        int offset = isupper(text[i]) ? 'A' : 'a';
        int key_index = i % key_len;
        int key_shift = toupper(key[key_index]) - 'A';
        if (!encrypt) key_shift = -key_shift;
        result[i] = (text[i] - offset + key_shift + 26) % 26 + offset;
    }
    result[i] = '\0';
}
int main() {
```

```
char plaintext[100], ciphertext[100], decryptedtext[100], keyword[100];
printf("Enter plaintext: ");
fgets(plaintext, sizeof(plaintext), stdin);
printf("Enter keyword: ");
fgets(keyword, sizeof(keyword), stdin);
plaintext[strcspn(plaintext, "\n")] = '\0';
keyword[strcspn(keyword, "\n")] = '\0';
vigenere(plaintext, keyword, ciphertext, 1);
printf("Encrypted text: %s\n", ciphertext);
vigenere(ciphertext, keyword, decryptedtext, 0);
printf("Decrypted text: %s\n", decryptedtext);
return 0;
}
```

Input and Output:

The screenshot displays a C++ IDE with the Vigenere cipher program code on the left and its execution output on the right. The code defines a `vigenere` function that encrypts or decrypts a plaintext using a keyword. The `main` function prompts the user for a plaintext and a keyword, then calls `vigenere` to perform the encryption and decryption.

The execution output shows the following sequence of events:

```
Enter plaintext: WORLD
Enter keyword: NETWORK
Encrypted text: JSHHR
Decrypted text: WORLD
-----
Process exited after 21.87 seconds with return value 0
Press any key to continue . . .
```

The compilation results at the bottom indicate that the program was compiled successfully with no errors or warnings. The output filename is `C:\Users\mishwarya\Downloads\4th ex (vigenere cipher).exe` and the compilation time was 5.72s.

Result: A c program to perform encryption and decryption of a message using Vigenere Cipher substitution technique is successfully executed.

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