**WEEK-7**

**AIM:**

Implement data encryption and data decryption

**THEORY:**

**Data Encryption and Decryption** are essential processes in securing digital information. They involve converting readable data (plaintext) into an unreadable format (ciphertext) to protect it from unauthorized access, and then reversing this process when access is needed.

**Encryption** is the process of converting plaintext into ciphertext using an encryption algorithm and an encryption key. This process ensures that only authorized users, who have the correct decryption key, can access the original data. Encryption protects data confidentiality during storage (at rest) and transmission (in transit).

**Decryption** is the reverse process of encryption, where ciphertext is converted back to plaintext using a decryption algorithm and key. This restores the original information to its readable form, making it accessible only to those with the correct decryption credentials.

**PROGRAM:**

#include <stdio.h>

#include <string.h>

// Function to encrypt the message

void encrypt(char \*message, int shift)

{

for (int i = 0; message[i] != '\0'; i++)

{

char ch = message[i];

// Encrypt uppercase letters

if (ch >= 'A' && ch <= 'Z') {

message[i] = (ch - 'A' + shift) % 26 + 'A';

}

// Encrypt lowercase letters

else if (ch >= 'a' && ch <= 'z') {

message[i] = (ch - 'a' + shift) % 26 + 'a';

}

}

}

// Function to decrypt the message

void decrypt(char \*message, int shift)

{

for (int i = 0; message[i] != '\0'; i++)

{

char ch = message[i];

// Decrypt uppercase letters

if (ch >= 'A' && ch <= 'Z') {

message[i] = (ch - 'A' - shift + 26) % 26 + 'A';

}

// Decrypt lowercase letters

else if (ch >= 'a' && ch <= 'z') {

message[i] = (ch - 'a' - shift + 26) % 26 + 'a';

}

}

}

int main()

{

char message[100];

int shift;

// Input the message

printf("Enter a message: ");

fgets(message, sizeof(message), stdin);

message[strcspn(message, "\n")] = 0; // Remove newline character

// Input the shift value

printf("Enter shift value: ");

scanf("%d", &shift);

// Encrypt the message

encrypt(message, shift);

printf("Encrypted message: %s\n", message);

// Decrypt the message

decrypt(message, shift);

printf("Decrypted message: %s\n", message);

return 0;

}

