| EX NO:04 | Perform encryption and decryption of a message using Vigenère Cipher substitution technique. |
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| DATE:22.02.24 | |

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

**Algorithm:**

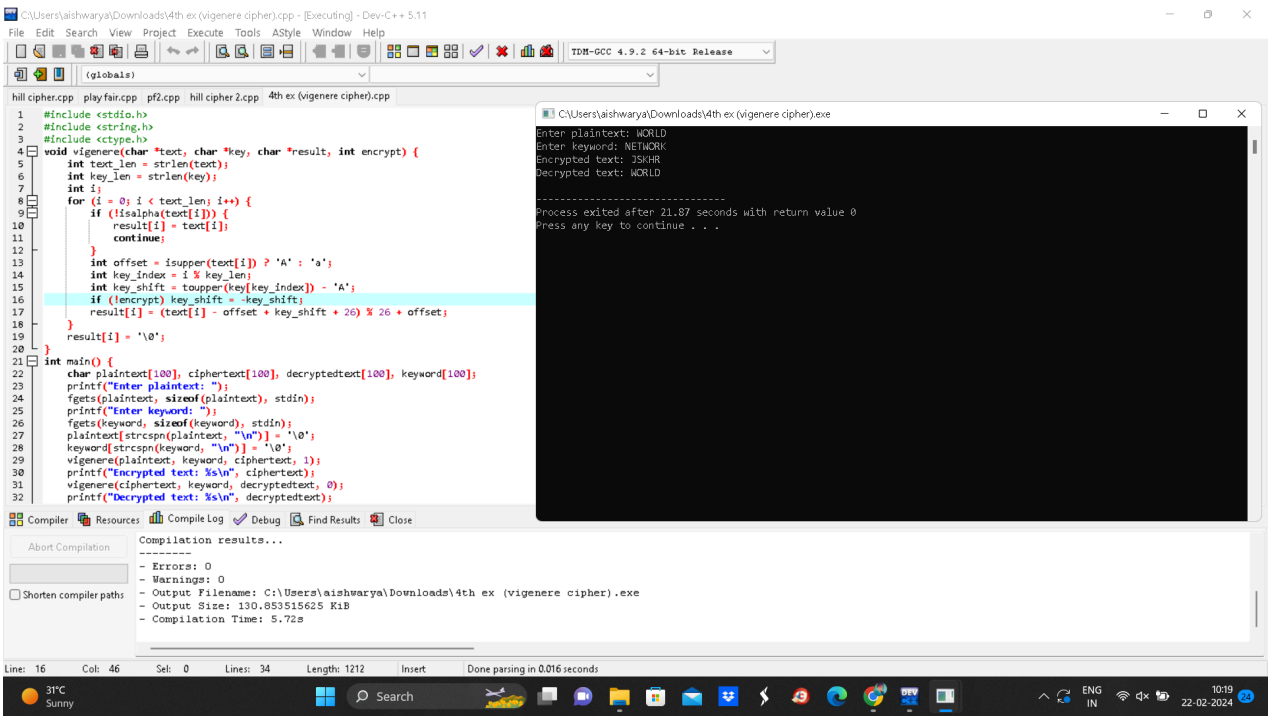
1. Include necessary header files (<stdio.h> and <string.h>).
2. Declare character arrays for the original message (msg), encryption key (key), new key (newKey), encrypted message (encryptedMsg), and decrypted message (decryptedMsg).
3. Declare integer variables msgLen, keyLen, i, and j for storing lengths 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:**



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

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