EX NO:05	Encrypt and decrypt a message by implementing Rail fence transposition technique.
DATE:22.02.24	

Aim: To write a c program to encrypt and decrypt a message by implementing Rail fence transposition technique.

Algorithm:

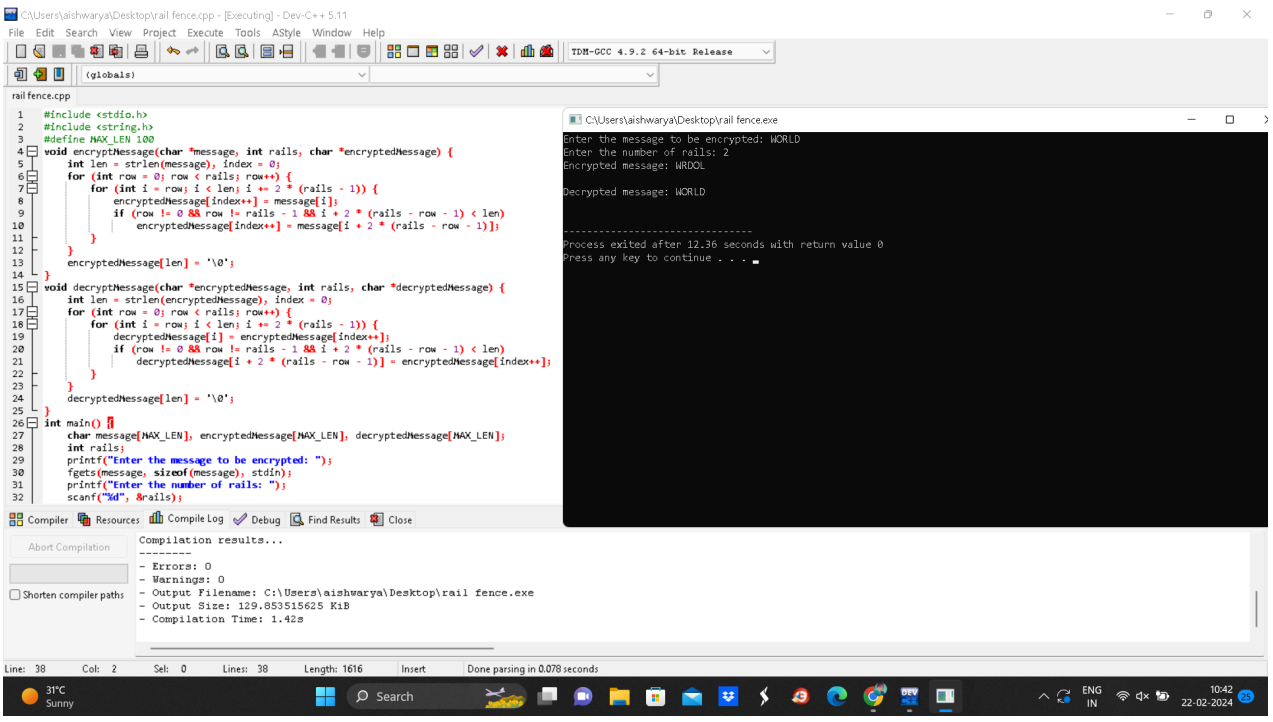
1. Include necessary header files (<stdio.h> and <string.h>).
2. Declare character arrays for the original message (msg), encryption key (key), new key (newKey), encrypted message (encryptedMsg), and decrypted message (decryptedMsg).
3. Declare integer variables msgLen, keyLen, i, and j for storing lengths 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>
#define MAX_LEN 100
void encryptMessage(char *message, int rails, char *encryptedMessage) {
   int len = strlen(message), index = 0;
   for (int row = 0; row < rails; row++) {
      for (int i = row; i < len; i += 2 * (rails - 1)) {
         encryptedMessage[index++] = message[i];
         if (row != 0 && row != rails - 1 && i + 2 * (rails - row - 1) < len)
            encryptedMessage[index++] = message[i + 2 * (rails - row - 1)];
      }
   }
   encryptedMessage[len] = '\0';
}
void decryptMessage(char *encryptedMessage, int rails, char *decryptedMessage) {
   int len = strlen(encryptedMessage), index = 0;
   for (int row = 0; row < rails; row++) {
      for (int i = row; i < len; i += 2 * (rails - 1)) {
         decryptedMessage[i] = encryptedMessage[index++];
         if (row != 0 && row != rails - 1 && i + 2 * (rails - row - 1) < len)
            decryptedMessage[i + 2 * (rails - row - 1)] = encryptedMessage[index++];
      }
   }
   decryptedMessage[len] = '\0';
}
int main() {
   char message[MAX_LEN], encryptedMessage[MAX_LEN], decryptedMessage[MAX_LEN];
```

```
    int rails;
    printf("Enter the message to be encrypted: ");
    fgets(message, sizeof(message), stdin);
    printf("Enter the number of rails: ");
    scanf("%d", &rails);
    encryptMessage(message, rails, encryptedMessage);
    printf("Encrypted message: %s\n", encryptedMessage);
    decryptMessage(encryptedMessage, rails, decryptedMessage);
    printf("Decrypted message: %s\n", decryptedMessage);
    return 0;
}
```

Input and Output:



Result: A c program to encrypt and decrypt a message by implementing Rail fence transposition technique is successfully executed.

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