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#include <stdio.h>
#include <string.h>

void rail_fence_cipher_encrypt(char *text, int key) {
    int len = strlen(text);
    char rail[key][len];

    for (int i = 0; i < key; i++) {
        for (int j = 0; j < len; j++) {
            rail[i][j] = '\n';
        }
    }

    int row = 0, col = 0;
    int dir_down = 0;

    for (int i = 0; i < len; i++) {
        rail[row][col++] = text[i];

        if (row == 0 || row == key - 1)
            dir_down = !dir_down;

        row += dir_down ? 1 : -1;
    }

    printf("Cipher Text: ");
    for (int i = 0; i < key; i++) {
        for (int j = 0; j < len; j++) {
            if (rail[i][j] != '\n')
                printf("%c", rail[i][j]);
        }
    }
    printf("\n");
}

void rail_fence_cipher_decrypt(char *cipher, int key) {
    int len = strlen(cipher);
    char rail[key][len];

    for (int i = 0; i < key; i++) {
        for (int j = 0; j < len; j++) {

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        rail[i][j] = '\n';
    }
}
```

```
int row = 0, col = 0;
int dir_down = 0;
```

```
for (int i = 0; i < len; i++) {
    rail[row][col++] = '*';

    if (row == 0 || row == key - 1)
        dir_down = !dir_down;

    row += dir_down ? 1 : -1;
}
```

```
int index = 0;
for (int i = 0; i < key; i++) {
    for (int j = 0; j < len; j++) {
        if (rail[i][j] == '*' && index < len) {
            rail[i][j] = cipher[index++];
        }
    }
}
```

```
row = 0, col = 0;
dir_down = 0;
char decrypted[len + 1];
int decrypt_index = 0;
```

```
for (int i = 0; i < len; i++) {
    decrypted[decrypt_index++] = rail[row][col++];

    if (row == 0 || row == key - 1)
        dir_down = !dir_down;

    row += dir_down ? 1 : -1;
}
```

```
decrypted[decrypt_index] = '\0';
printf("Decrypted Text: %s\n", decrypted);
}
```

```
int main() {
    char text[100];
    int key;

    printf("Enter text to encrypt: ");
    fgets(text, sizeof(text), stdin);
    text[strcspn(text, "\n")] = 0;

    printf("Enter key (number of rails): ");
    scanf("%d", &key);

    rail_fence_cipher_encrypt(text, key);

    char cipher[100];
    printf("Enter the cipher text to decrypt: ");
    scanf(" %[^\n]", cipher);

    rail_fence_cipher_decrypt(cipher, key);

    return 0;
}
```