

Run Length Encoding

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#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#define MAX_LEN 100

char *runLengthEncoding(char *sourceStr)
{
    int len = strlen(sourceStr), resultLen, index, j=0, k;
    char *finalStr = (char *)malloc(sizeof(char)*(len*2 + 1));
    char count[MAX_LEN];
    for(index = 0; index < len; index++)
    {
        finalStr[j++] = sourceStr[index];
        for(resultLen = 1; index + 1 < len && sourceStr[index] == sourceStr[index+1];
            resultLen++, index++);
        //copy resultLen in a character array count[]
        sprintf( count, "%d", resultLen);

        //copy the count[] to finalStr
        for(k = 0; count[k]; k++, j++)
            finalStr[j] = count[k];
    }
    finalStr[j] = '\0';
    return finalStr;
}

int main()
{
    char str[100];
    printf("Enter string");
    scanf("%s", str);
    printf("%s\n", runLengthEncoding(str));
    return 0;
}
```

Time complexity: $O(n)$

Space complexity: $O(n)$